VOL. XXVII NEW YORK—THURSDAY, SEPTEMBER 5, 1912—CHICAGO No. 10

The AUTOMOBILE

Mercedes Lowers Records at Elgin

De Palma Wins Elgin and Free-For-All Races — Stutz, Mercer and Mason Winners of Their Respective Events

Mercedes, No. 4, driven by Ralph De Palma, winning Elgin and free-for-all race, August 31, on Elgin course; races run simultaneously. His average for the Elgin race was 68.4 miles an hour and in the free-for-all 76 miles an hour, distances 254 and 305 miles

Bergdoll, prominent driver in the Elgin free-for-all contest

ELGIN, ILL., Sept. 3—Ralph De Palma won the Elgin National trophy race and the free-for-all race at Elgin, on Saturday, August 31. Ralph Mulford was second in the former event and Erwin Bergdoll was second in the free-for-all. On Friday Hugh Hughes was an easy victor in the Aurora trophy race, with Pullen second. The Jencks trophy race went to Endicott, while Charles Merz won the Illinois trophy event, with Anderson second.

De Palma, driving a Mercedes, for the first time in his racing career won, overcoming the ill-luck which has overtaken him on all previous occasions. His speed for the 254 miles and 1,050 feet of the Elgin National race was 68.4 miles an hour, while for the free-for-all race, which was run simultaneously with it, he averaged 68.9 an hour for 305 miles and 204 feet. His fastest lap, the last lap of the longer race,

SUMMARIES OF THE ELGIN RACES

FREE-FOR-ALL

Distance, 305 miles and 204 feet

1—De Palma	Mercedes	68.9 m.p.h.
2—Bergdoll	Benz	67.5 m.p.h.
3—Mulford	Knox	66.6 m.p.h.

ELGIN RACE

1—De Palma	Mercedes	68.4 m.p.h.
2—Mulford	Knox	67.3 m.p.h.
3—Merz	Stutz	64.2 m.p.h.
4—Roberts	Mason	63.8 m.p.h.
5—Anderson	Stutz	63.3 m.p.h.

ILLINOIS TROPHY

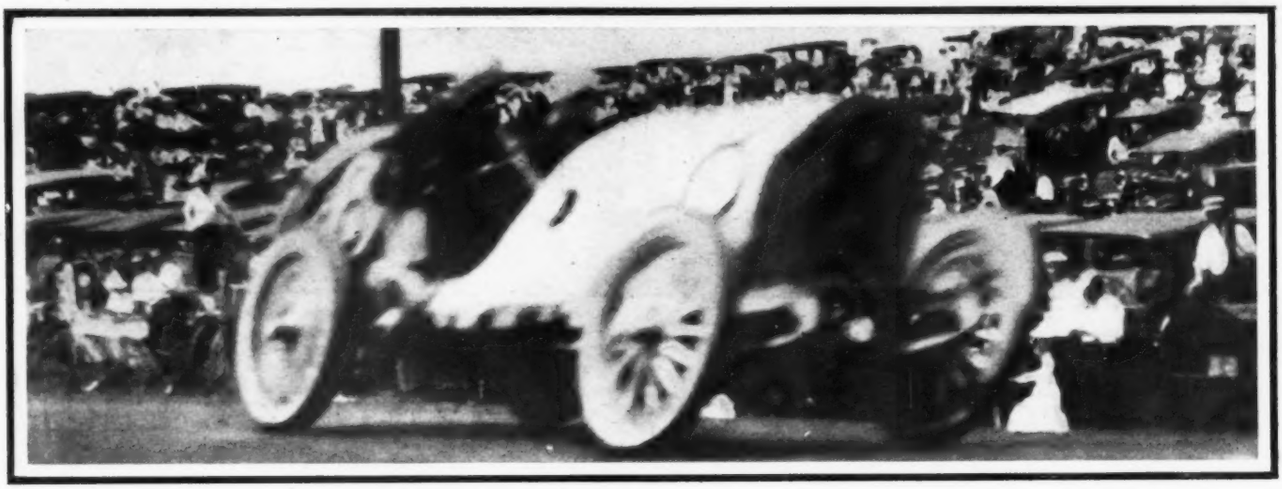
1—Merz	Stutz	66.11 m.p.h.
2—Anderson	Stutz	65.6 m.p.h.

AURORA TROPHY RACE

1—Hughes	Mercer	65.0 m.p.h.
2—Pullen	Mercer	62.3 m.p.h.
3—Trussell	Falcar	54.0 m.p.h.

JENCKS TROPHY RACE

1—Endicott	Mason	60.57 m.p.h.



Bergdoll's big Benz traveling at over 67 miles an hour in the free-for-all. He led throughout the greater part of this race

was made at a speed of 74.6 miles an hour. The lap distance is 8 miles, 2,499 feet, and his time for the lap was 6:49. Bergdoll, in a Benz, was entered only in the free-for-all race, and in coming in second averaged 67.5 miles an hour for the thirty-six laps. Mulford, in a Knox, averaged 66.6 miles an hour.

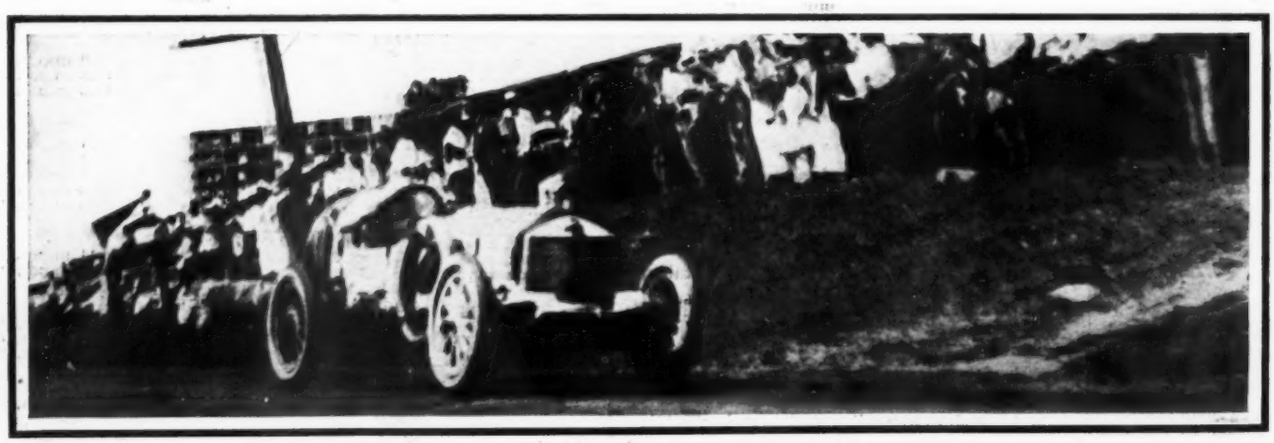
Saturday's races were easily the most sensational yet seen at Elgin, and the winners were always in doubt up to the last minute. Tire trouble deprived Bergdoll of the longer race when it seemed as though he would be the sure winner. No serious accidents took place, although Mulford was overcome by the heat and Clark, driving a Mercedes, and his mechanician, were pitched over a fence, while several others ran into the straw-banked turns.

The crowd was a record one, and completely filled all available space. Officials of the meet estimated the attendance at 60,000. Weather conditions were ideal for both days, and perhaps had something to do with the time made by the leaders. On Friday the time was slow in the various events, but Saturday's figures made up for this. De Palma succeeded in his last lap in making the remarkable speed of 74.6 miles an hour, establishing a new record for the Elgin course.

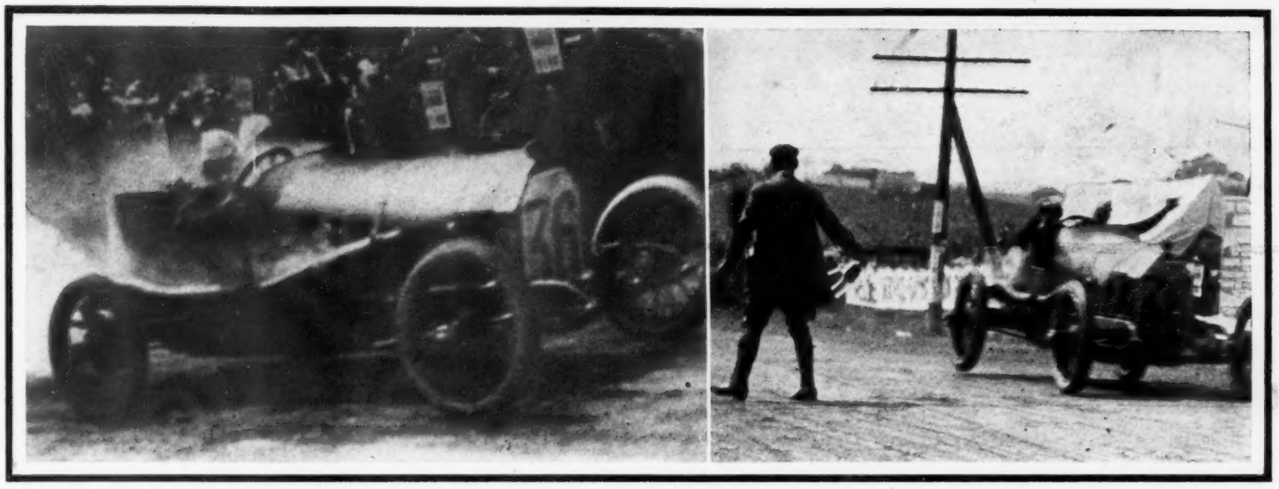
Friday's races were less exciting than those of the following day. Hughes, driving a Mercer, in winning the Aurora trophy race, had things all his own way, and was never headed during the entire run. The Mason Special, driven by Endicott, was also an easy winner, the only other two contendants for this event being a Ford, driven by Henning, and a Herreshoff, driven by Wordingham, both of which cars were out of the race long before the finish, due to accidents. The Illinois trophy race, won by Merz in a Stutz, had four contenders at the start, while

FREE-FOR-ALL RACE RUN AT ELGIN ON

No.	Car—Driver	Lap Miles	1 8	2 16	3 25	4 33	5 42	6 50	7 59	8 67	9 76	10 84	11 93	12 101	13 110	14 118	15 127	16 135
4	MERCEDES	Elapsed Time		14:17	21:35	28:45	36:01	43:23	50:41	59:14	66:21	73:32	80:39	87:47	94:55	102:17	110:12	117:33
	DePalma	Lap Time	7:08	7:09	7:18	7:10	7:14	7:22	7:18	8:33	7:07	7:11	7:07	7:08	7:08	7:22	7:55	7:21
8	BENZ	Elapsed Time		14:04	20:55	27:59	34:57	41:58	49:00	55:58	63:00	70:10	77:11	84:13	91:06	98:11	105:22	112:28
	E. Bergdoll	Lap Time	7:09	6:55	6:51	7:04	6:58	7:01	7:02	6:58	7:32	7:10	7:01	7:02	6:53	7:05	7:11	7:02
1	KNOX SIX	Elapsed Time		14:21	21:28	28:53	36:08	43:22	50:41	59:43	66:55	73:55	80:58	87:56	95:00	102:08	112:59	120:14
	Mulford & Chandler	Lap Time	7:15	7:06	7:07	7:25	7:15	7:14	7:19	9:02	7:12	7:00	7:03	6:58	7:04	7:08	10:51	7:15
5	FIAT 70	Elapsed Time		15:38	23:41	31:32	39:07	46:45	54:11	61:27	68:39	75:50	83:07	90:28	97:37	116:36	124:05	131:32
	E. Hearne & G. Hill	Lap Time	7:52	7:46	8:03	7:51	7:35	7:38	7:26	7:16	7:12	7:11	7:17	7:27	7:09	18:59	7:29	7:27
15	MERCER 35	Elapsed Time		14:55	22:13	29:29	39:38	47:13	54:32	61:52	69:19	76:41	84:06	91:27	98:47	107:55	115:23	122:48
	H. Hughes	Lap Time	7:36	7:19	7:18	7:16	10:09	7:35	7:19	7:20	7:27	7:22	7:25	7:21	7:20	9:08	7:28	7:25
2	MERCEDES	Elapsed Time		16:48	24:16	31:37	38:59											
	C. Clark	Lap Time	9:25	7:23	7:38	7:21	7:22	Out—Ran into fence—smashed both rear wheels.										
9	FIAT	Elapsed Time																
	Bruce-Brown	Lap Time	Car did not arrive in time for race.															
11	NATIONAL 40	Elapsed Time																
	N. Whalen	Lap Time	Magneto coupling damaged day previous.															



Ralph Mulford letting up on his Knox Six for a few seconds in the free-for-all. Later in this race he was overcome by the heat



Winning Mercer with Hughes at the wheel swinging around a turn and car being flagged at the finish of the Aurora Trophy

only one other car, another Stutz, with Anderson at the wheel, finished. Damage to their machines prevented the other two entrants from becoming serious rivals of the Stutz cars, and the race developed into merely a Stutz family quarrel.

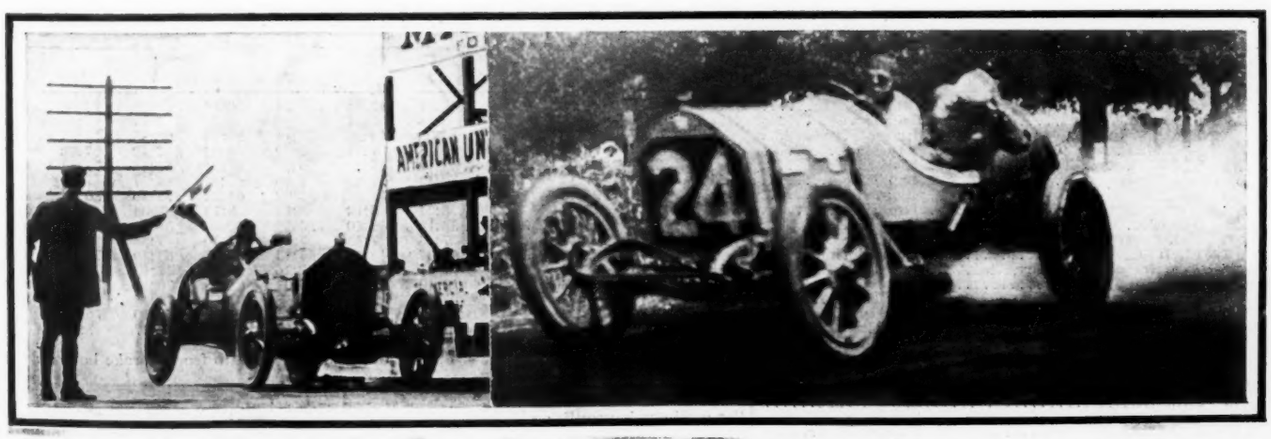
One feature of the Elgin races this year was the remarkable freedom from accidents and the entire absence of fatalities to either contestants or spectators. Each driver and mechanician was examined by the surgeons of the Elgin National road races, who reported that all were physically fit to take part in the races. These physicians stated they were unable to find any of the contestants suffering from diseases which would in any way tend to cause sudden illness during any race, and a carefully made table showing the age and rate and character of pulse of each man was submitted to the referee. This is practically the only racing association which adheres strictly to such a rule.

Saturday's Features

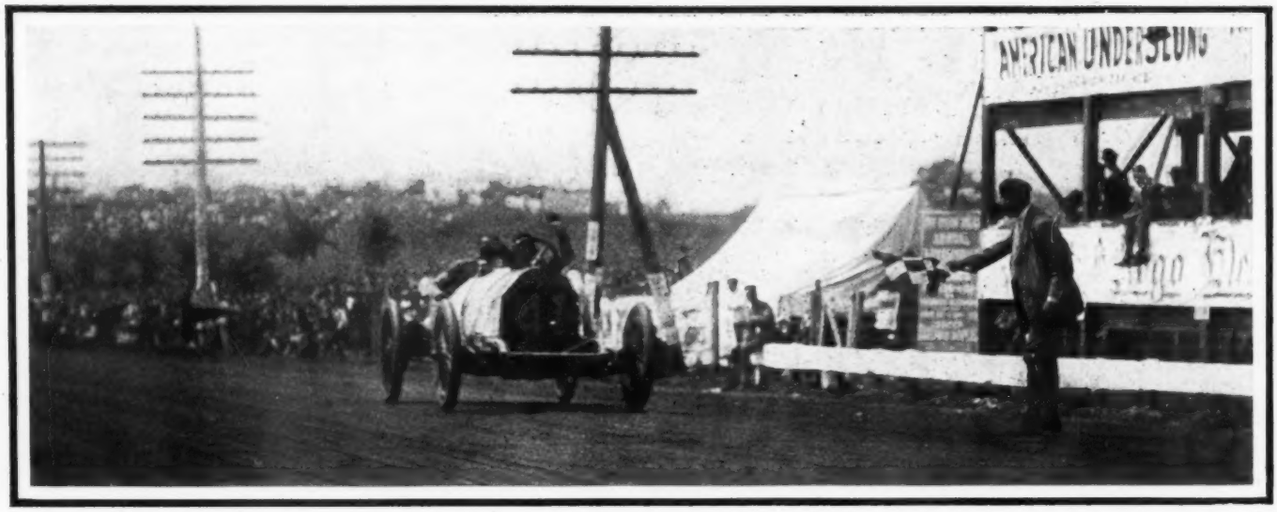
THE feature races of the Elgin meet were those run on Saturday, which were for the Elgin National Watch Company trophy and the free-for-all. They were the most sensational ever seen by the Elgin racegoers. While there were fifteen entries, only ten cars lined up for the long grind of 254 miles in the Elgin National race, and 305 miles in the free-for-all, which event was only added this year. The two races were run simultaneously, several of the cars competing in both, the Benz entry, which was driven by Bergdoll, Philadelphia's millionaire racing driver, not being eligible in the Elgin National race for the reason that its piston displacement was over 600 cubic inches

SATURDAY, AUGUST 31; 305 MILE

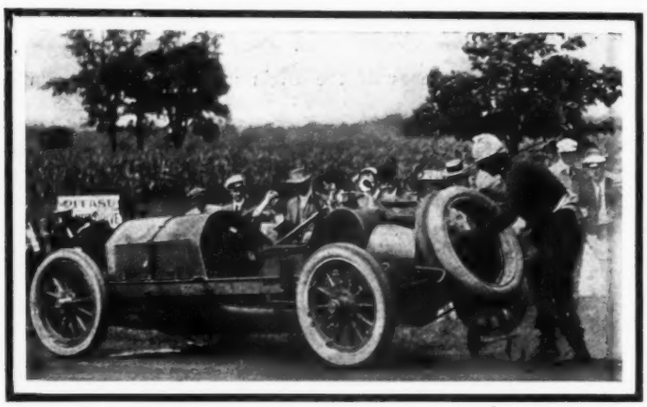
17 144	18 152	19 160	20 169	21 177	22 186	23 194	24 203	25 211	26 220	27 228	28 237	29 245	30 254	31 262	32 271	33 279	34 288	35 296	36 305	Miles per Hr.
124:37	131:34	138:31	145:32	152:36	159:37	166:43	174:01	183:46	190:59	198:38	207:33	214:57	223:20	230:23	237:39	244:53	251:51	258:47	265:36.25	68.9
7:04	6:57	6:57	7:01	7:04	7:01	7:06	7:18	9:45	7:13	7:39	8:55	7:24	8:23	7:03	7:16	7:14	6:58	6:56	6:49	
119:36	126:49	133:54	144:14	151:19	158:45	168:40	176:00	183:14	190:22	197:32	204:44	211:52	219:04	226:25	233:45	243:19	250:57	259:26	270:28.28	67.5
7:08	7:13	7:05	10:20	7:05	7:26	9:55	7:20	7:14	7:08	7:10	7:12	7:08	7:12	7:21	7:20	9:34	7:38	8:29	11:02	
127:19	134:28	143:32	150:32	157:29	164:28	171:31	178:39	185:46	192:56	200:03	206:57	217:30	226:09	233:28	241:01	249:29	258:22	266:14	274:08.72	66.6
7:05	7:09	9:04	7:00	6:57	6:59	7:03	7:08	7:07	7:10	7:07	6:54	10:33	8:39	7:19	7:33	8:28	8:53	7:52	7:54	
139:10	146:49	154:36	162:23	169:59	177:47	185:24	193:08	200:48	212:27											
7:38	7:39	7:47	7:47	7:36	7:48	7:37	7:44	7:40	7:39	Out—Transmission trouble										
131:39																				
8:51	Out—Burned out crankshaft bearing.																			



Stutz 24 with Merz driving, receiving the winning flag and at the right making its victorious dash in one of the late laps



Mason Special, H. Endicott driving, as it came up to the line all alone at the finish of the Jencks Trophy race, its competitors having withdrawn



Mercer 35, Wishart driver, repairing two blown-out tires

which was the maximum permitted entrants in that contest.

It was a representative gathering of famous racing drivers that lined up before the immense crowd in the grand stand, awaiting Starter Wagner's tap on the shoulder, which was the signal to begin the long run. Ralph De Palma, who has had perhaps the greatest amount of ill-luck during his career in the speed game, was at the wheel of the big Mercedes, entry No. 4. Ralph Mulford, last year's Vanderbilt cup winner, was in control of the Knox Six and was given a rousing cheer when his car was pushed into position at the tape. Eddie Hearne, in the 70-horsepower Fiat, lined up in the fifth position, and looked rather diminutive behind the immense red hood of entry No. 5. Erwin Bergdoll, in the big Benz, was the eighth to line up. Behind him was Charlie Merz, in his Stutz winner of the day before. Hughie Hughes, winner of last year's Elgin Kane Count event, and Friday's Aurora trophy race, was the last to get into position.

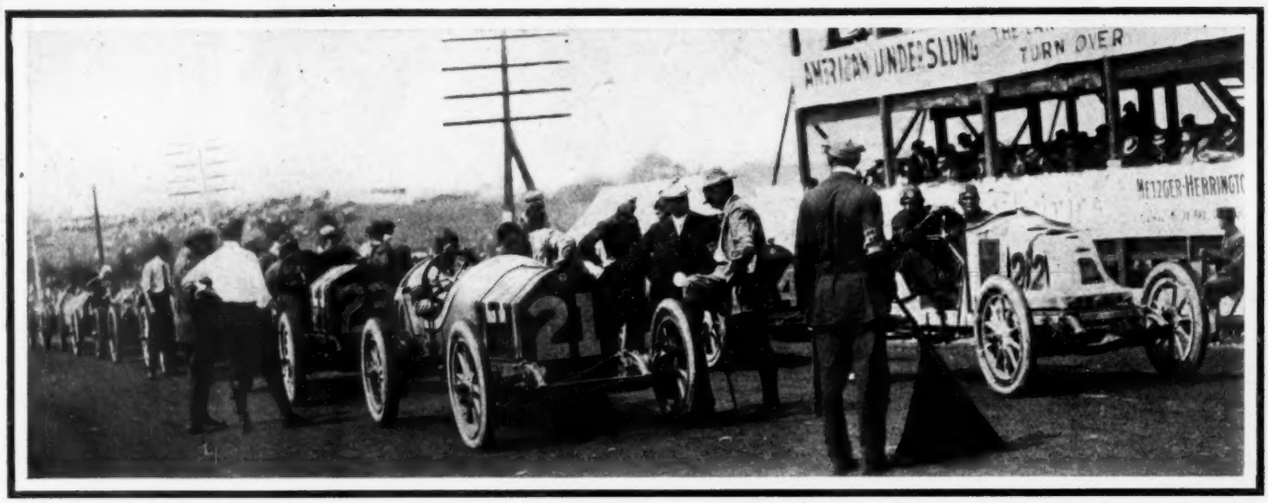
It was easily seen that the crowd liked Mulford. After a delay of 15 minutes, while the pit men tinkered with De Palma's Mercedes' stubborn clutch, Mulford was sent off at 11:15 amid a cloud of smoke. The familiar sight to old followers of the races of two men cranking the big Knox was repeated before the enthusiastic crowd. Mulford's mechanician was at the crank, while he was aided in his efforts by a pit man, who pulled on a long leather strap. The big motor took up its work and Mulford was away down the stretch.

AURORA TROPHY RACE OF 152 MILES.

No.	Car—Driver	Miles / Feet	1 / 8 / 2499	2 / 16 / 4998	3 / 25 / 2217	4 / 33 / 4716	5 / 42 / 1935	6 / 50 / 4434	7 / 59 / 1653	8 / 67 / 4152
36	MERCER	E.Time.	7:52	15:26	22:53	30:32	38:33	46:20	54:22	62:17
	H. Hughes	L.Time.	7:52	7:34	7:27	7:39	8:01	7:47	8:02	7:55
31	MERCER	E.Time.	8:21	16:15	24:11	32:07	40:05	48:01	56:06	64:30
	N. Pullen	L.Time.	8:21	7:54	7:56	7:56	7:58	7:56	8:05	8:24
33	FALCAR	E.Time.	9:28	22:57	32:05	41:13	50:44	60:04	69:07	78:17
	H. Trussel	L.Time.	9:28	13:29	9:08	9:08	9:31	9:20	9:03	9:10
34	MASON	E.Time.	8:36	23:10	31:18	39:26	47:41	55:56	64:41	72:40
	M. Roberts	L.Time.	8:36	14:34	8:08	8:08	8:15	8:15	8:45	7:59
32	FALCAR	E.Time.	10:15	20:30	30:48	40:36	50:47	60:57	70:55	83:16
	H. Hastings	L.Time.	10:15	10:15	10:18	9:48	10:11	10:10	9:58	12:21
35	MERCER	E.Time.	8:04	15:45	23:30	42:01	49:40	57:23	65:07	76:46
	S. Wishart	L.Time.	8:04	7:41	7:45	18:31	7:39	7:43	7:44	7:39

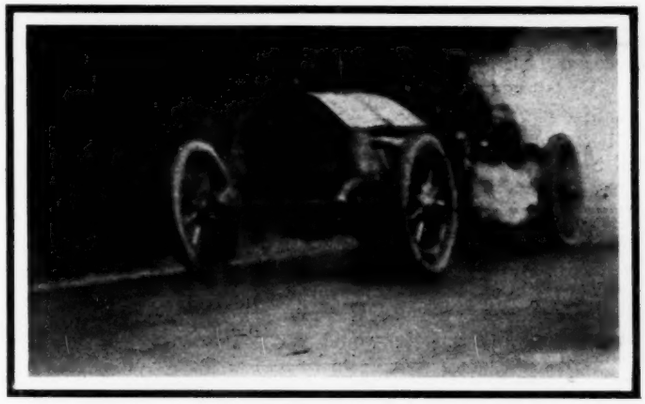
RACE OF 254 MILES (30 LAPS OF THE COURSE) FOR THE ELGIN

No.	Car—Driver	Lap Miles	1 / 8	2 / 16	3 / 25	4 / 33	5 / 42	6 / 50	7 / 59	8 / 67	9 / 76	10 / 84	11 / 93	12 / 101
4	MERCEDES	Elapsed Time		14:17	21:35	28:45	36:01	43:23	50:41	59:14	60:21	73:32	80:39	87:47
	De Palma	Lap Time	7:08	7:09	7:18	7:15	7:16	7:22	7:18	8:33	7:17	7:11	7:07	7:08
1	KNOX SIX	Elapsed Time		14:21	21:28	28:53	36:08	43:22	50:41	59:43	66:55	73:55	80:58	87:56
	R. Mulford	Lap Time	7:15	7:06	7:07	7:25	7:15	7:14	7:19	9:02	7:12	7:00	7:03	6:58
12	STUTZ	Elapsed Time		15:29	23:03	30:38	38:12	45:50	53:29	61:11	68:48	76:27	84:05	91:42
	C. Merz	Lap Time	7:51	7:38	7:34	7:35	7:34	7:38	7:39	7:42	7:37	7:39	7:38	7:37
3	MASON SPL	Elapsed Time		15:52	23:45	31:41	39:42	47:54	56:09	64:22	72:26	80:28	88:21	96:18
	M. Roberts	Lap Time	8:03	7:49	7:53	7:56	8:01	8:12	8:15	8:13	8:04	8:02	7:53	7:57
7	STUTZ	Elapsed Time		15:29	23:01	30:43	38:16	45:50	53:19	60:49	68:23	75:54	83:26	90:56
	G. Anderson	Lap Time	7:51	7:38	7:32	7:42	7:33	7:34	7:29	7:30	7:34	7:31	7:32	7:31
5	FIAT 70	Elapsed Time		15:38	23:41	31:32	39:07	46:47	54:14	61:27	63:39	75:50	83:07	90:28
	E. Hearne and G. Dix	Lap Time	7:52	7:46	8:03	7:51	7:35	7:38	7:26	7:16	7:12	7:11	7:17	7:21
14	MERCER 35	Elapsed Time		16:05	24:03	31:54	39:40	47:25	55:03	62:35	70:10	77:43	85:19	92:59
	S. Wishart	Lap Time	8:07	7:58	7:58	7:51	7:46	7:45	7:38	7:32	7:35	7:33	7:36	7:40
15	MERCER 35	Elapsed Time		14:55	22:13	29:29	39:38	7:10	54:32	61:52	69:19	76:41	84:06	91:27
	H. Hughes	Lap Time	7:30	7:19	7:18	7:16	10:09	7:05	7:19	7:20	7:27	7:22	7:25	7:21
2	MERCEDES	Elapsed Time		16:48	24:16	31:37	38:59							
	G. Clark	Lap Time	9:25	7:23	7:28	7:21	6:52	Car skidded—ran into fence—broke both rear wheels.						
6	FALCAR	Elapsed Time												
	H. Hastings	Lap Time	Car not in racing condition.											
10	FALCAR	Elapsed Time												
	G. Trussel	Lap Time	Car not in racing condition.											
11	NATIONAL 40	Elapsed Time												
	N. Whalen	Lap Time	Magneto drive damaged on Friday, putting car out of race.											



Line-up of the contestants in the Illinois and Jencks Trophy races—the eventual winner of the longer race—Stutz 24 is in the middle ground

Next came Clark in Mercedes No. 2. The powerful car jumped into motion at a word from the starter and was off after Mulford. Then came the little Mason, winner of the day before in the Jencks trophy event. Following it, De Palma, in Mercedes No. 4, came to the tape. The onlookers were in sympathy with him, and more than one hoped his ill-luck of the past would not deprive him of honors this time. The little Italian determinedly shot his car down the course. Then Eddie Hearne, driving the Fiat which, according to the program, Teddy Tetzlaff was to drive, was sent off. It was doubtful if he would be able to finish the race because of his weak wrist. Following Anderson's Stutz, Bergdoll, in the Benz, received the word from Starter Wagner. After what seemed an interminable wait, Charlie Merz, in the other Stutz, was away. This left only the two yellow Mercers at the tape. Wishart was next to go, Hughie Hughes alone remaining. It was not until nearly time for Hughes to come to the line that his attendants cranked his motor, and with the good wishes of the crowd he was off after the others.



Trussel's Falcar which finished third in the Aurora Trophy

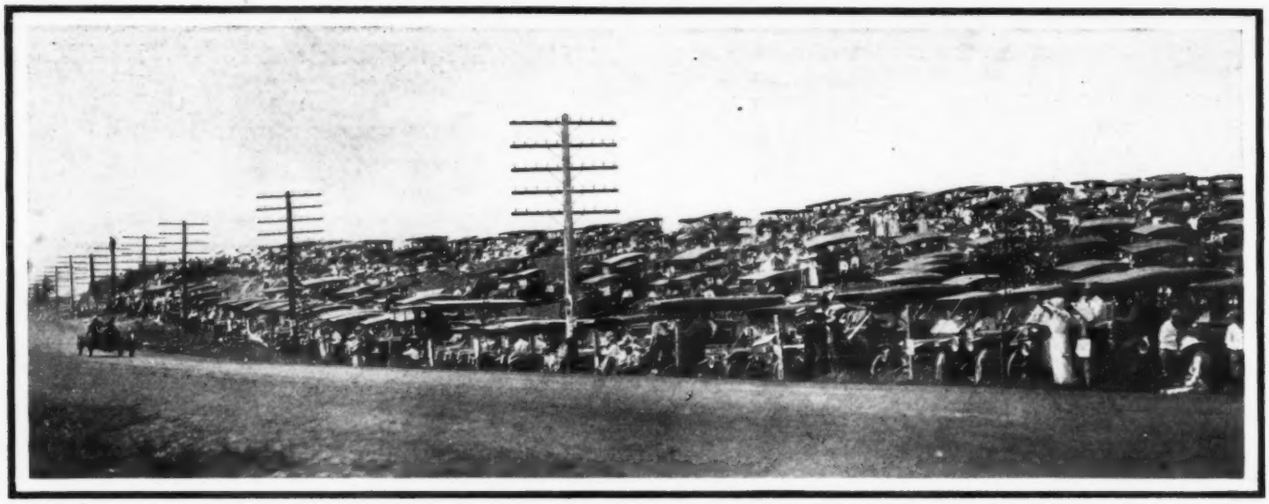
Hardly was Hughes out of sight around the Hornbeek turn when Mulford, running well, hove into sight, and had soon completed his first lap. Then came De Palma, in his Mercedes, driving like a demon, having passed Clark in the other Mercedes and Roberts in the Mason in the first lap. He was soon out of sight after Mulford. He had made the circuit in 7:08, 7 seconds faster than Mulford, putting him in first place immediately. This gave Mulford second position, while Hughie

RUN AT ELGIN ON FRIDAY, AUGUST 30

9 76 1371	10 84 3870	11 93 1089	12 101 3588	13 110 807	14 118 3306	15 127 525	16 135 3024	17 144 243	18 152 2742	Miles per Hour
70:09	77:58	86:24	94:31	102:28	110:10	117:57	125:42	133:01	140:40	65.0
7:52	7:49	8:26	8:07	7:57	7:42	7:41	7:45	7:23	7:35	
72:58	80:28	90:28	98:25	106:21	114:21	122:09	130:15	138:26	146:31:45	62.3
8:08	7:50	7:57	7:57	7:56	8:00	7:48	8:06	8:11	8:05	
87:28	96:44	105:55	115:05	124:09	133:15	142:18	151:16	160:14	169:19	54.0
9:11	9:16	9:11	9:10	9:04	9:06	9:03	8:58	8:58	9:05	
80:41	88:47	96:45	104:45	113:58	128:53	141:12	153:50	167:23	178:11	51.7
8:01	8:06	7:58	8:00	9:13	14:55	12:19	12:38	13:33	10:48	
90:38	105:19	115:13	125:04	134:57	144:51	154:33	164:34	174:20	183:57:53	49.7
7:22	14:41	9:54	9:51	9:53	9:54	9:52	9:51	9:54	9:37	
80:25	96:00	106:37	114:26	122:17						
7:39	15:35	10:37	7:49	7:51	Out—Sprung rear axle.					

NATIONAL WATCH COMPANY TROPHY, RUN AT ELGIN ON SATURDAY, AUGUST 31

13 110	14 118	15 127	16 135	17 144	18 152	19 160	20 169	21 177	22 186	23 194	24 203	25 211	26 220	27 228	28 237	29 245	30 254	Miles per Hr.
94:55	102:17	110:12	117:33	124:37	131:34	138:31	145:32	152:36	159:37	166:43	174:01	183:46	190:59	198:38	207:33	214:57	223:06	68.4
7:06	7:22	7:55	7:21	7:04	6:57	6:57	7:01	7:04	7:01	7:06	7:18	9:45	7:13	7:39	8:55	7:24	8:23	
95:00	102:08	112:59	120:14	127:19	134:28	143:32	150:32	157:29	164:28	171:31	178:39	185:46	192:56	200:03	206:57	217:30	226:09.26	67.3
7:04	7:08	10:51	7:15	7:05	7:09	9:04	7:00	6:57	6:59	7:03	7:07	7:07	7:10	7:07	6:54	10:33	8:39	
102:50	113:36	121:30	129:18	137:04	144:47	152:29	160:08	167:49	175:36	183:17	190:58	198:30	206:15	214:00	221:34	229:16	236:43.50	64.2
11:08	10:46	7:54	7:48	7:46	7:43	7:42	7:79	7:41	7:47	7:41	7:41	7:32	7:45	7:45	7:34	7:42	7:27	
104:02	111:53	119:39	127:26	135:21	144:33	152:26	160:08	167:58	175:42	183:30	191:16	199:07	206:58	214:50	222:40	230:30	238:17	63.8
7:44	7:51	7:46	7:47	7:00	9:12	7:47	7:48	7:50	7:44	7:48	7:46	7:48	7:51	7:52	7:50	7:50	7:47	
98:27	105:59	113:24	120:55	129:18	136:57	144:36	153:29	160:08	169:32	178:26	186:55	199:24	209:46	217:14	224:48	232:24	239:57.60	63.3
7:29	7:32	7:25	7:31	8:23	9:39	7:39	8:43	7:39	8:24	8:54	8:29	12:29	10:22	7:28	7:34	7:36	7:33	
97:37	116:36	124:05	131:32	139:10	146:49	154:36	162:23	169:59	177:47	185:24	193:08	200:48						
7:09	18:59	7:29	7:27	7:38	7:39	7:47	7:47	7:79	7:48	7:37	7:44	7:40	Out—Transmission trouble.					
100:44	108:24	116:02	123:35	131:12	140:01	147:38	155:10	170:49	187:55	195:43	226:59							
7:45	7:40	7:38	7:35	7:37	8:49	7:37	7:32	10:19	17:06	7:48	31:16	Out—Broken oil lead and water pump.						
98:47	107:55	115:23	122:48	131:31														
7:20	9:08	9:28	9:25	8:51	Out—Burned out crankshaft bearing.													



Hundreds of cars were massed about the course at various points of vantage from which the automobilists might obtain a clear view of the course

Hughes was third, Metz fourth, Hearne fifth in the Elgin National race. Considering all the cars, the Benz, which was not entered in the Elgin National, was second, with Mulford in the Knox third, and Hughes fourth.

Bergdoll was driving at terrific speed, and succeeded in coming to first place in the second lap, while De Palma, also getting all the power out of his Mercedes, had to be contented with second position. Mulford was now in third place. In the third lap Mulford changed positions with De Palma, Bergdoll in the Benz still retaining the lead. This he held from lap No. 2 on through the twenty-second lap, or 186 1-3 miles of his long grind of 305 miles. In this lap he was obliged to stop on the back stretch on account of tire trouble. This delay gave De Palma the lead, which he maintained in the twenty-third and twenty-fourth laps. He would, no doubt, have led Bergdoll longer had he not been obliged to stop at the pit at the end of the twenty-fourth lap to take on gasoline and oil and to replace his left rear tire. This wait put Bergdoll again in the lead, which he retained for ten of the remaining twelve laps of the free-for-all race. De Palma was now in second place, while in the same lap Mulford was a close third, which position he had held since the fifteenth lap, or 127 miles had been passed. He was pressing De Palma closely, and in the twenty-sixth lap succeeded in regaining second position, about 2 minutes behind Bergdoll, in the Benz, while De Palma was less than a minute slower than he.

The twenty-ninth lap saw tire trouble for both Mulford and De Palma. The latter stopped at the pit after completing this lap and to him the short wait seemed endless. He was all eagerness to be away. But before he was off again Mulford also stopped at his pit for identically the same reason. Immediately De Palma saw his chance. He pressed his attendants to their utmost and was away again, fairly lifting his machine from the ground in getting off. There was only a single lap remaining to the Elgin National race, and De Palma realized it fully. It was the fastest lap of his race, and he made it in 6:49, for the first time in his career crossing the tape the winner of a race. But he did not slacken his speed, for he had still six laps to go in the free-for-all race in which he was also entered.

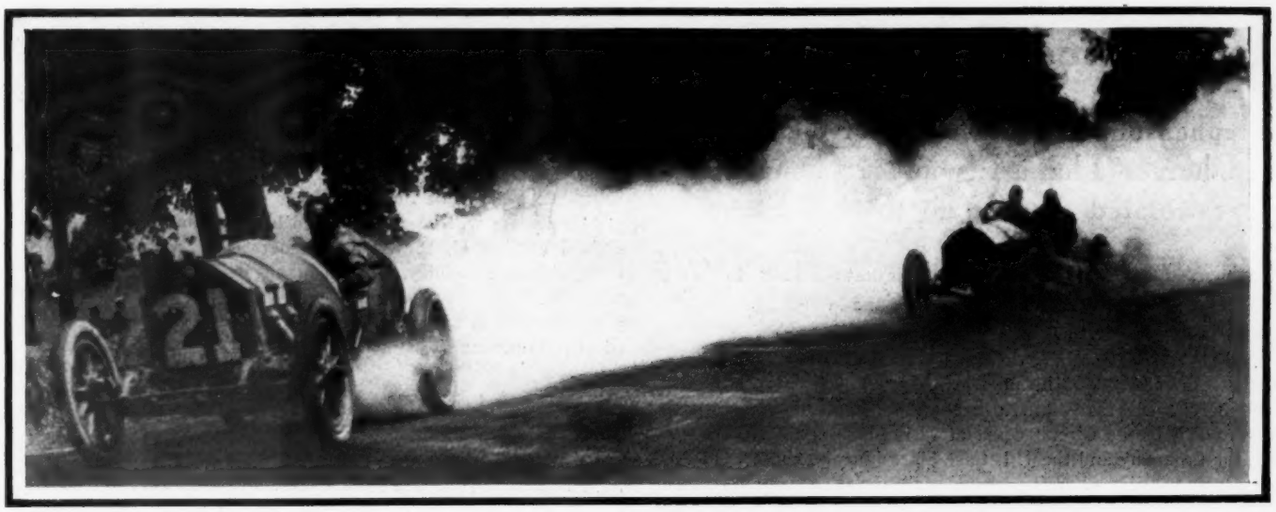
The course from the main stand before post call

Mulford was next to finish, and while De Palma's average speed for the Elgin National race was 68.4 miles an hour, that of Mulford was slightly less, as the tables show.

Meanwhile, the other cars were changing their positions somewhat. After completing three laps, Hearne was obliged to quit Fiat No. 5 because of his wrist becoming too weak to properly control the car. George Hill, mechanician for Tetzlaff, took his place in the big red machine. He lost no time in getting the Fiat under way again, and drove daringly and with the nerve of a veteran for twenty-three laps. When Hill took the wheel he was in sixth place, but in the sixth lap Clark's Mercedes, which had been in fifth position, was put out of the race by accident, giving this position to Hill in the Fiat. In the eighth lap Hill took the fourth position in the Elgin National, which had been held by Merz in the Stutz. Two laps later he took third position from Anderson in the other Stutz, and retained it through the thirteenth, when he dropped to seventh place, Merz regaining his former place in the van. Trouble with the transmission was rapidly taking on serious proportions, judging by the

RESULTS OF THE ILLINOIS TROPHY RACE, 301

No.	Car—Driver		1 Miles 8 Feet 2499	2 16 4998	3 25 2217	4 33 4716	5 42 1935	6 50 4434	7 59 1653	8 67 4152	9 76 1371	10 84 3870
24	STUTZ	Elapsed Time	7:44	15:16	22:46	30:20	37:48	45:18	52:51	60:27	68:02	75:38
	C. Merz	Lap Time	7:44	7:32	7:30	7:34	7:28	7:30	7:33	7:36	7:35	7:36
21	STUTZ	Elapsed Time	8:00	15:49	23:30	31:15	38:54	46:34	54:12	61:49	69:25	76:56
	G. Anderson	Lap Time	8:00	7:49	7:41	7:45	7:39	7:40	7:38	7:37	7:36	7:31
23	NATIONAL	Elapsed Time	7:46	15:28	23:09	30:44	38:21	46:02	53:45	61:56	72:06	Out—Broken
	N. Whalen	Lap Time	7:46	7:42	7:41	7:35	7:37	7:41	7:43	8:11	10:10	mag. drive
22	RAYFIELD	Elapsed Time	8:35	34:32								
	W. Hobbs	Lap Time	8:35	25:57	Pit—Out—Burned out main bearing.							



Anderson's Stutz, which finished second to its team mate in the Illinois Trophy race, in a lively brush takes the pace midway of contest

Pullen's Mercer, place winner in the Aurora Trophy

noise emanating from Hill's machine, and after completing twenty-six laps he was obliged to quit the race on this account. He was then in sixth place.

The first car to drop out was the Mercedes, driven by Clark, which, after staying in fifth place on the fifth lap, was preparing to negotiate the Hornbeek turn, the first after passing the pits, and was driven into the straw banking of the turn and damaged sufficiently to put it out of the race. Clark miscalculated the turn, ran into a small concrete culvert located at this point, with sufficient force to blow up one of his tires. This sent his car swerving to the right and into the fence, breaking both rear wheels and pitching himself and his mechanician over the fence. Neither man was seriously hurt, each being only slightly bruised. Had it not been for the straw bales banking the turn, the accident would undoubtedly have been serious. Curiously enough, Clark had objected previously to the use of the straw for this purpose.

As a safety element these straw bales at the four turns demonstrated their worth. Not only did they save Clark and his mechanician, but they prevented injury to Wishart, whose Mercer got off the course at one turn, and to Wordingham, who also ran into them, ditching his Herreshoff car and breaking one of its wheels, without injury to himself or his companion.

Following Mulford, Merz, in Stutz No. 12, was next to finish in the Elgin National race. He came into this position, due to the accident to Wishart's car in the twenty-fifth lap, when the latter's oil lead and water pump broke, and to Hughes' Mercer, which was running well up to the eighteenth lap, when it burned out a crankshaft bearing, rendering it useless as a contender for honors.

These various accidents left only three cars to contend in the free-for-all. These were Bergdoll's Benz, De Palma's Mercedes and Mulford's Knox. The final performance of these three cars was the most sensational of the 2 days' meet. Bergdoll was in the lead at the beginning of the thirty-first lap, with

(*Continued on page 496.*)

JENCKS TROPHY RACE

No.	Car—Driver	Lap Miles	1 8	2 16	3 25	4 33	5 42	6 50	7 59	8 67	9 76	10 84	11 93	12 101	Miles per Hr.
41	MASON SPL.....	Elapsed Time..	8:05	16:07	23:58	32:13	40:42	49:18	57:59	66:28	79:51	83:24	92:11	100:42.9	60.57
	H. Endicott.....	Lap Time.....	8:05	8:02	7:51	8:15	8:29	8:29	8:41	8:29	8:23	8:33	8:47	8:31	
42	FORD.....	Elapsed Time...	12:15	29:46	41:40	54:21	66:13	87:28							
	Henning.....	Lap Time.....	12:15	17:31	11:54	12:41	11:52	21:15	Out—Car ditched.						
43	HERRESHOFF.....	Elapsed Time...	10:49												
	Wordingham	Lap Time.....	10:49	Out—Broken wheel.											

MILES, RUN AT ELGIN, ILL., ON FRIDAY AUGUST 30

11 93 1089	12 101 3588	13 110 807	14 118 3306	15 127 525	16 135 3024	17 144 243	18 152 2742	19 160 5241	20 169 2460	21 177 4959	22 186 2178	23 194 4677	24 203 1896	Miles per Hour
85:13	92:00	99:46	107:22	114:59	122:38	130:23	138:11	146:00	153:40	161:22	169:12	176:49	184:32:25	66.11
7:35	8:47	7:46	7:36	7:37	7:39	7:45	7:48	7:46	7:40	7:42	7:50	7:37	7:43	
84:33	92:08	99:48	108:27	116:26	124:22	132:11	140:02	147:47	155:36	163:12	170:56	178:37	186:14:15	65.6
7:37	7:35	7:40	8:39	7:59	7:56	7:49	7:51	7:45	7:49	7:36	7:44	7:41	7:37	

Pierce and Case Are Sued

Stephenson, Manufacturer of Utility Car, Charges That Milwaukee Companies Violated Agreement to Buy Plant

Packard Dealers, 150 Strong, Formulate Plans to Tour United States and Canada

MILWAUKEE, WIS., Sept. 3—The Stephenson Motor Truck Company, of Milwaukee, Wis., manufacturing "Utility" commercial cars at South Milwaukee, on Saturday, August 31, filed a suit in the Circuit court at Milwaukee against the Pierce Motor Company and the J. I. Case Threshing Machine Company, of Racine, Wis., charging them with violating an agreement whereby the Pierce and Case owners agreed to purchase the plant of the Stephenson company for $100,000 worth of the capital stock of the Pierce company. The trial will be transferred to Racine county by mutual agreement and promises to be most interesting. The official complainants are George L. Stephenson, Charles Matthews, A. E. Halderman, Fred M. Stephenson, Paul Durant and Frederick Gettelman, and the official defendants are Frank K. Bull, Richard T. Robinson and F. Lee Norton.

The complaint charges that from the time of the alleged agreement, in January, 1912, the Case company agreed to act as sales agent for the Stephenson company until the Stephenson works were taken over on August 1, 1912. It is charged that the defendants have refused to comply and that the Stephenson company, by reason of discontinuing all of its own sales agencies, and announcing to its patrons that it was no longer selling its product directly, suffered a great decrease in sales and now has on hand a large number of motor vehicles which it cannot sell because of the termination of its own selling outlets.

It was stipulated, the complaint says, that if at the time of the purchase of the Stephenson company's plant, scheduled for August 1, 1912, the assets amounted to less than $40,000, the difference was to be subtracted from the amount of the capital stock to be paid to the directors of the Stephenson company, and that if the assets exceeded $40,000 in value, an additional amount of stock was to be added to the consideration.

It is stated that the Stephenson company became affiliated with the Pierce and Case companies because of the desire to add commercial vehicles to the Case line of products, which includes Case cars, manufactured by the Pierce Motor Company, which is owned by the directors of the Case company.

Insurance Probe Meets Snag

The problem of automobile insurance, particularly as it applies to commercial vehicles, is still some distance from a solution. The matter was referred to James S. Marvin, assistant general manager of the N. A. A. M., for investigation and report and Mr. Marvin ran into an obstacle early in the proceedings. After conference with the insurance men Mr. Marvin found that the first element of information required from him by the insurance men was as to how long trucks are kept in garages and how long they are in service each average day.

As such figures must be gained by a detailed canvass and as no such general detailed canvass has been made, the pursuit of that special line had to be postponed until such time as the figures should be available. Such a canvass will be undertaken in the near future.

Packard Dealers to Cruise

DETROIT, MICH., Sept. 2—About 150 dealers and salesmen from the principal cities of the United States and Canada, will be guests of the Packard Motor Car Company on a 3-day lake cruise, which will constitute the annual convention of the Packard sales corps.

The steamer City of St. Ignace has been chartered. The route extends through Lake St. Clair and Lake Huron, then down into Lake Erie to Buffalo and return. The boat leaves Detroit Tuesday, September 3, and will stop in Cleveland for a theater party the evening of September 4.

The dealers will be accompanied by a number of Packard officials, including H. B. Joy, president; S. D. Waldon, vice-president; Alvan Macauley, general manager, and H. H. Hills, sales manager.

In addition to business discussions there will be various forms of entertainment, including concerts by the Packard brass band.

More Cars, or More Service?

With upwards of 40,000 actual automobile freight cars in service upon the various railroad lines of the United States and with the prospective shipment of 100,000 carloads of automobiles from the factories to market, the supply of freight cars for this service would appear to be sufficient if each car suitable for automobile shipment could be made to make 2 1-2 trips each during the shipping season.

Reports from Detroit that an effort was being made to persuade the railroads to furnish 50,000 more freight cars for automobile traffic have been circulated recently.

Some additions to the present equipment will be made but nothing approximating the number requested. According to the railroads the additional equipment will be about 5,000.

Automobile Securities Quotations

With the approach of the time limit of the extension granted to the United States Motor Company by its creditors, a period of inactivity has settled upon the market for automobile securities. Sellers and buyers appear to be about evenly balanced with volume of trading rather on the small side. There is a distinctly strong undertone in the market for shares generally which finds expression in the stiffness of American Locomotive, both issues of General Motors and the standard investment shares, but with the exception of General Motors the upward movement has been fractional. Goodrich, which was listed on the New York Stock Exchange last week, has maintained its advance and the other rubber shares partake of its strength. The table showing the current level compared with the market last year is as follows:

	1911		1912	
	Bid	Asked	Bid	Asked
Ajax-Grieb Rubber Co., common	..	..	145	165
Ajax-Grieb Rubber Co., pfd	..	..	95	100
Aluminum Castings, preferred	..	..	99	102
American Locomotive, common	38	38¼	45¼	46
American Locomotive, preferred	106	107	109	110
Chalmers Motor Company	..	..	145	150
Consolidated R. T. Co., common	5	10	14	17
Consolidated R. T. Co., preferred	10	20	50	60
Firestone Tire & Rubber Co., common	179	181	285	290
Firestone Tire & Rubber Co., pfd	105	107	106	108
Garford Company, preferred	..	..	99	101
General Motors Company, common	42	43	42	43
General Motors Company, preferred	80	82	82	83
B. F. Goodrich Company, common	243	245	77½	79
B. F. Goodrich Company, pfd	118¾	119¾	107½	108½
Goodyear Tire & Rubber Co., common	230	240	330	334
Goodyear Tire & Rubber Co., pfd	105	107	105	106½
Hayes Manufacturing Company	..	..	..	97
International Motor Co., common	..	..	27½	28½
International Motor Co., pfd	..	..	84	88
Lozier Motor Company	..	..	50	60
Miller Rubber Company	..	..	142	150
Packard Motor Co., preferred	..	..	105½	107
Peerless Motor Company	..	..	115	120
Pope Manufacturing Company, common	42	46	38½	40
Pope Manufacturing Company, pfd	72	77	73½	74½
Reo Motor Truck Company	8½	10	9¾	10¾
Reo Motor Car Company	23	25	22½	24½
Studebaker Company, common	..	..	42½	43½
Studebaker Company, preferred	..	..	94	95½
Swinehart Tire Company	..	..	95	97
Rubber Goods Company, common	..	..	100	105
Rubber Goods Company, preferred	..	..	107	110
U. S. Motor Company, common	30	32	3¾	4
U. S. Motor Company, preferred	70	71	11	12
White Company, preferred	..	..	107	109

According to traffic managers of several of the big automobile companies the requirement is not so much for more cars as it is for more service from present equipment.

The average time for a trip from Detroit to New York is about 60 hours and from any factory with first-rate handling facilities to any point of consignment 1,000 miles away is not more than 5 days. The return trip should take no longer and the various delays, loading and reconsignment ought not to occupy more than 1 month.

On this basis, figuring the shipping season at 120 days and the number of automobile cars available at 50,000 and the average time of the round trip at 40 days, the cars should be able to transport 150,000 carloads. At an average of 2 1-2 automobiles to the carload, they would account for the shipment of 375,000 automobiles, or considerably more than the probable output.

The difficulty that lies in the way of such a solution of the trouble is that automobile cars are used for other purposes during the rush season.

Imports Large—Rubber Steady

Imports of crude rubber for the week ending August 24 amounted to 14,272 packages to which must be added 1,673 packages of waste, the whole valued at $1,768,000. The waste was valued at $59,000. Local trade has been quiet and while the actual sales are said to be small, the volume of imports in connection with the steady market means that the demand is sufficient to maintain prices. This would argue in favor of a large general business. Prices remained about stationary throughout the past week, the level being at $1.20 1-2 per pound for up-river fine.

Market Changes for the Week

The holidays stifled activity in the materials market to some extent this week, and as a result there are few changes to note as compared with last Wednesday. The metal market was rather steady all through the week, with no special activity except in the cases of lead and tin, both of which gained materially during the week. Both Lake Superior and electrolytic copper remained at their nominal quotations throughout the week, and the same holds for the prices of steel products, among which beams and channel products continue to be sold at the ask price.

Fine up-river para rubber declined 1 cent a pound on the first day of the week in response to the London trend, and has since remained at the same price. Gasoline, oils and lubricants also underwent no changes. Linseed oil formed an exception in this respect, rising from 68 to 69 cents on the last day of the week, thereby recovering from its decline about 2 weeks ago. Cotton oil was also strong and closed 19 cents higher than the market opened.

Material	Wed.	Thurs.	Fri.	Sat.	Tues.	Week's Change
Antimony, lb.	.07½	.07½	.07½	.07½	.07½	.....
Beams & Channels, 100 lbs.	1.51½	1.51½	1.51½	1.51½	1.51½	.....
Bessemer Steel, Pittsburgh, ton	22.50	22.50	22.50	22.50	22.50	.....
Copper, Elec., lb.	.17⅜	.17⅜	.17⅜	.17⅜	.17⅜	.....
Copper, Lake, lb.	.17⅝	.17⅝	.17⅝	.17⅝	.17⅝	.....
Cottonseed Oil, September, bbl.	6.29	6.27	6.31	6.40	6.40	+ .19
Cyanide Potash, lb.	.19	.19	.19	.19	.19	.....
Fish Oil (Menhaden)	.33	.33	.33	.33	.33	.....
Gasoline, Auto, 200 gals. @	.21	.21	.21	.21	.21	.....
Lard Oil, prime	.85	.85	.85	.85	.85	.....
Lead, 100 lbs.	4.67½	4.65	4.85	4.85	4.85	+ .17½
Linseed Oil	.68	.68	.68	.69	.69	+ .01
Open-Hearth Steel, ton	23.00	23.00	23.00	23.00	23.00	.....
Petroleum, bbl., Kansas Crude	.70	.70	.70	.70	.70	.....
Petroleum, bbl., Pa. Crude.	1.60	1.60	1.60	1.60	1.60	.....
Rapeseed Oil, refined	.68	.68	.68	.68	.68	.....
Rubber, Fine Up-river Para	1.20	1.20	1.20	1.20	1.20	.....
Silk, raw Ital.	....	4.15	....	....	....	.....
Silk, raw Japan	....	3.82½	....	....	....	.....
Sulphuric Acid, 60 Beaumé	.99	.99	.99	.99	.99	.....
Tin, 100 lbs.	46.50	46.80	47.70	47.70	47.50	1.00
Tire Scrap	.09	.09	.09	.09	.09	.....

Receiver For Thomas

Judge Hazel Directs G. C. Finley to Take Charge of the Affairs of Defunct Company—Receiver Silent as to Future

Assets of Thomas Company $740,000 in Excess of Liabilities and Reorganization Is Not Improbable

BUFFALO, N. Y., Sept. 3—Judge John R. Hazel, in United States District Court here last Thursday granted an order appointing George C. Finley, secretary of the M. D. Taylor company, and Adolph Rebadow, attorney of the law firm of Rebadow & Ladd, receivers for the E. R. Thomas Motor Car Company. The order provides that the receivers for the automobile company are to continue the business of that concern and bond for the receivers was fixed at $50,000. Application for the appointment of receivers for the Thomas company was made by Charles B. Sears, of the law firm of Rogers, Locke & Babcock. The E. R. Thomas Motor Car Company was represented at the hearing by William L. Marcy, of Moot, Sprague, Brownell & Marcy.

The receivership of the Thomas plant resulted from action in equity brought by creditors on the grounds that the E. R. Thomas Motor Car Company, while entirely solvent, was temporarily unable to meet its obligations. Extension notes given at the time of the reorganization of the Thomas company a year ago could not be met at maturity. The notes, which totalled $250,000, fell due this year on August 1. The holders of $210,000 worth of these notes agreed to grant a 3-month extension but holders of the remaining $40,000 declined.

The E. R. Thomas Motor Car Company succeeded about a year ago to the business of the E. R. Thomas Motor Company when that concern was reorganized. The liabilities of the Thomas company today are said to be $960,000 while assets total $1,700,000. Merchandise creditors of the Thomas company are to hold a meeting in the near future and it is anticipated that a reorganization of the company will be the result. At the meeting which will probably be held this week the receivers of the Thomas company undoubtedly will act on the resignations of Frederick R. Humpage, president of the Thomas plant; William L. Gleason, vice-president and general manager, and John J. Ramsey, treasurer. The resignations of these prominent automobile officials was received with the greatest of surprise. The resignations are said to have been tendered together, but authorities in the Thomas plant decline to give further statements on the matter until action has been taken by the company's receivers. President Humpage declines to state why he resigns from the concern but probably will discuss the matter after the receivers' action.

Concerning the matter of the continuation of the business of the Thomas company, George C. Finley, receiver for the concern, has this to say:

"I am unable to say at this time just how long the business will be continued. The receivers have taken hold of it, and intend to put the business on its feet if that is possible. Of course, we do not know just at present what the exact conditions are in the plant. The permanent continuation of the business will depend greatly upon what we find." The forces of the plant were reduced about 200 in number on Saturday but the business will be continued if possible.

Chicago Show Blanks Issued

Application blanks for space at the thirteenth annual automobile show at Chicago have been issued. The pleasure car section will be held February 1-8 and the commercial vehicle section February 10-15. The rental rate is fixed at 90 cents a square foot for each show.

U. S. Motors Plan Due

Committee Working on Reorganization Scheme to Be Announced Before Friday of Next Week

Important Meetings of National Organizations Scheduled To Take Place Early in October

FRIDAY, September 13 is the date upon which the 90-day extension granted by the creditors of the United States Motor Company will expire and before that date a plan of reorganization will be presented to the creditors and owners of the company. In fact, three different plans have been suggested to the creditors' committee and while official confirmation is lacking, it is quite certain that one of these plans, modified by suggestions of the merchandise creditors will be favorably reported.

The first draft of this plan has been prepared but pending official action those interested decline to say anything about it. Meetings of the committee have been held three different times within the past week and the announcement of the main facts contained in the plan may be expected at any time.

It is understood that some additional capital is necessary and that it will have to be secured; that one or more of the companies connected with the organization will have to curtail its production and that the 1913 manufacturing campaign, already well under way, will be conducted on conservative lines so as to avoid extraordinary calls upon the company's resources prior to the season when adequate returns are available to meet such calls.

At the headquarters of the company it was learned that shipment of the 1913 product is continuing satisfactorily and while all the officers are guarded in their statements, there is a feeling of growing optimism as to ultimate results.

On the New York curb a sharp break was scored in both common and preferred issues, but later there was a good recovery, the net loss being only fractional. It was reported after the break that the selling pressure was by speculators who had loaded up at recent lower levels and took profits on the subsequent rise.

Big Meetings for October

Meetings of the Automobile Board of Trade and the National Association of Automobile Manufacturers, scheduled for the first week in October promise to be among the most interesting gatherings ever held by those organizations. There will be the regular monthly meetings of the associations; the twice postponed convention of salesmanagers; the allotments of space at the national shows and probably a gathering of automobile makers, the like of which has never been witnessed so far in the industry.

There are a number of live topics to be considered by the members, including the tentative merger and the scope and extent of the big organization that will result.

The probable date of the sales managers convention is October 1.

Exported Cars Less in Price

WASHINGTON, D. C., Aug. 31—According to figures compiled by the federal bureau of statistics, $30,000,000 worth of American automobiles and parts found markets abroad during the fiscal year 1912, as against less than $1,000,000 worth 10 years ago. The figures show that the exports of motor cars to foreign countries in the fiscal year were valued at $21,500,000; of parts thereof, including tires, $6,750,000. If to this were added the shipments to Hawaii and Porto Rico, we get for the year's sales of American cars outside of continental United States a round $30,000,000, since the value of motor cars and parts thereof sent to Porto Rico was nearly $1,000,000 and to the Hawaiian Islands a little over $1,000,000. The total number of cars exported to foreign countries was 21,757, valued at $21,550,139, averaging slightly less than $1,000 each, while those to the non-contiguous territory were higher, averaging $1,600 each.

The export price of American cars in 1912 averaged less than in any earlier year in the history of the export trade. The average for 1912, dividing the total number of cars exported into stated value, was $990 each, against $1,100 in 1911, $1,380 in 1910, $1,700 in 1909, and $1,880 in 1908.

On the import side the motor cars imported last year amounted to but about $2,000,000 in value, against more than $4,000,000 in 1907. The average import value of the cars brought into the country last year was $2,216 each, against $2,138 in 1911, $1,936 in 1910, $1,788 in 1909 and $2,392 in 1908. Thus the export price of American cars has fallen from $1,880 in 1908 to $990 in 1912, while the import price of foreign cars entering the country has only fallen from $2,392 in 1908 to $2,216 in 1912, the reduction in price on the export side being 47 per cent. and on the import side but 8 per cent.

Marion Names District Managers

INDIANAPOLIS, IND., Aug. 31—In connection with the active sales department which the Marion Motor Car Company is now organizing, there have been appointed four district sales managers who are men of wide experience and acquaintanceship.

These men are C. H. Tyler, who has just resigned as manager of the United States Motor Company's Cleveland branch; C. B. Riggs, who gives up the management of the Oldsmobile branch in Kansas City; W. W. McClure, who has been associated with the Marion interests in Texas, and Howard W. Harrington, who has been in charge of the Marion on the Pacific Slope.

To Build Argyll Engine in Canada

OSHAWA, ONT., Sept. 3—The Hackett Motor Car Company, Ltd., of this city have secured the patent rights to manufacture the Argyll engine in Canada. Hitherto the Argyll car has been made in Scotland only but an enterprising group of Canadian capitalists have purchased the manufacturing rights for the Dominion. This concern will be known as the Hackett Motor Car Company. Last spring they bought out the plant of the Matthew Guy Automobile Works, Oshawa, and the equipment there will be enlarged to enable the company to turn out a very largely increased output. It is the intention of the Hackett company to build high-class automobiles equipped with the Argyll valveless engine. It is announced there will be a four and a six-cylinder model. They will also build a cheaper car with a different engine. The latter will be a thoroughly reliable and up-to-date car, and it is the intention to place it on the market at a price below $1,000.

Alco Truck at Wells, Nevada

WELLS, NEV., Sept. 3—The Alco transcontinental truck reached this place today after passing through a series of tropical floods. Much work had to be done in road construction as the poor existing roads had been washed out in many places. The total distance to date is 3,323 miles and there still remains about 650 miles to travel before reaching the destination. Progress has been slow for 2 weeks on account of the extraordinary difficulties that had to be surmounted.

Bumper Crops in North Dakota

FARGO, N. D., Sept. 3—Bumper crop conditions in North Dakota this fall are attracting the attention of automobile manufacturers and dealers everywhere with the result that a number of new agencies have already been established or announced for

Fargo and many other cities. Old agencies already in the territory are increasing their sales forces to handle the increased amount of business which the dealers believe is assured.

Crops in the state are now beyond the prospect stage and it is certain that the farmers will harvest the biggest yields of the past 15 years. While harvest and threshing have been delayed by the heavy and frequent rains during August the work is now far enough along to forestall further weather damage and to give reliable indications of what the yields will be.

Wheat, the leading crop of the state, will give a yield several bushels above the average for the last ten years and almost double the yields reported for the two previous years, both of which were attended with crop failures. Reports that the heavy rains had started the grain sprouting in the shock are denied by farming experts who have traveled through the state. In certain sections of the state grades have been lowered but the damage is not sufficient to affect the state as a whole.

Flax, barley, rye and oats are all yielding crops far above the average. Corn is ripening rapidly now and experts believe that for the first time in the history of the state the farmers will raise their own seed corn for 1913 planting. Potatoes have been attacked by a form of stem rot. In spite of what damage this may do the yield is likely to be so large that the price will go very low.

Automobile salesmen are already busy among the farmers of the state and the number of orders received at the branch houses is increasing rapidly.

Receiver for King Company

It was reported in New York, on Tuesday, that the Union Trust Company, of Detroit, had been named receiver for the King Motor Car Company, by the United States District Court under bond of $5,000. An order granting an extension of time for the making up of certain stock on hand has been allowed. The company has been in existence since the spring of 1911. Charles B. King, the designer of the product, was backed in the venture by H. Kirke White.

The stockholders of the company are, generally speaking, rated as wealthy men and three plans for continuance of the business on a permanent basis are under consideration.

These plans are as follows: First, one of the stockholders is ready to take over the business. Second, a reorganization of the corporation with the present stockholders, starting all over again and third, it is reported that an outsider stands ready to take over the corporate interests.

The car was widely advertised in New York and had secured quite a material business in the metropolitan district.

J. R. Ballinger Killed in Accident

CHICAGO, ILL., Sept. 3—J. R. Ballinger for 4 1-2 years connected with the Stromberg Motor Devices Company, Chicago, Ill., was accidentally killed on August 30 when the car which he was driving from Chicago to Elgin for the races overturned in passing another machine. At the time of his death Mr. Ballinger was assistant to the sales manager of the Stromberg company. When he first took a position with the concern he was employed as stenographer and had risen rapidly to his present position. He was 27 years of age. No successor has as yet been appointed.

Exporters to Meet and Dine

The American Manufacturer's Export Association has announced its third annual meeting and banquet which will be held at the Hotel Astor, September 20-21. The association's members now transact an export business of $160,000,000 and an effort is being made to secure additions to the membership before the opening of the Panama canal so that the total business represented shall be above $500,000,000 a year.

W. B. Campbell is president of the association and Henry T. Wills, secretary.

Testing Convention Meets

International Association Comes Together and Begins Considering of Long and Interesting Program

Opening Session Is Attended by Delegations From Every Progressive Nation

WITH an attendance estimated at 600, including representatives of every advanced nation on the globe, the sixth congress of the International Association for Testing Materials came together Monday morning in New York. The convention will remain in session until September 7 and on the following day the official tour as outlined in previous issues of THE AUTOMOBILE is scheduled to commence. This will take up all the time until Sunday, September 15.

President Taft is the patron of the congress although not present personally. The opening day was devoted to organization and a formal reception to the members and ladies under the joint auspices of the American Society for Testing Materials and allied societies.

The real business of the congress commenced on Tuesday when the army, State of New York and the city welcomed the delegates and the professional sessions commenced.

In the metals division the speakers were: E. H. Saniter and twelve others who treated hardness and wear tests, impact tests and slag inclusions. Mr. Saniter used as an illustration in the testing of hardness and resistance the dry abrasion process on lubricated material and his conclusions were that hardness tests are unreliable as indicators of wearing properties.

F. Robin spoke on wear tests, showing results were not uniform under varying conditions and that each specific form should have its special test.

R. Guillery on tests for hardness, elastic limit and resilience under impact described three machines for making tests. The first was a ball-hardness machine with micrometer to measure the indentation caused by spring pressure upon the specimen. The second was an elastic limit device equipped to compress a truncated cone specimen while an autographic record is made to locate the point where set begins. C. Grard on studies of hardness of steels said that he believed it practicable to specify hardness and impact test requirements in steel specifications.

G. Charpy on impact tests recommended the study of the different testing machines and apparatus and reported for the committee the recommendation that a system of calibration and checking should be established as a prime requisite. He said that the relation between impact-test results and service value not having been fully established, the collection of statistics on the subject is recommended.

A. Schmid treating on the influence of shape of testpiece and treatment on notched-bar impact tests said that the previous size of testpiece was too large and that 10 mm., 60 mm. in span, with notch 2.5 mm. deep of radius 1 mm. gave satisfactory results.

The other speakers took up various phases of steel tests, treating of tough steels, brittleness, resilience, tensile-impact, slag inclusions and non-metallic impurities.

The Society of Automobile Engineers through the Iron and Steel Division of the Standards Committee adopted a set of strict steel specifications which has been augmented and modified from time to time and the international society with which the test congress is affiliated accepted the standards as applied to automobile making. The specifications, however, were not applied generally on account of the small limits of tolerance allowed. Some sort of action relative to the S. A. E. specifications will probably be taken before the close of the sessions.

Segregating Truck and Car Marketing

Pro and Con of Problem as Shown by Tendencies and Experience of the New York Selling Establishments—Drift Is Now Toward Separation

WHEN the automobile industry was young, it was considered quite the thing to have its advertisements read about like this: "The Bildad Motor Car Company has secured the agency for the Splitquick Truck, one of the most prominent among the commercial vehicles. This completes the Bildad line, which now contains in addition to the Splitquick truck, the Lemon gasoline, Pulmonary Electric and the reliable Asthma steam cars."

Mr. Bildad's sales force handled three lines of pleasure cars and the business wagons with admirable impartiality even if the salesmen lacked much detailed and definite information about any of the stock.

There were several New York agencies which sold, or attempted to sell, as many as six different makes of automobiles at once. Gradually the conviction came to the proprietors of the agencies that two lines of different makes represented about the limit for a single store and while there are a number of agencies along Gasoline Row that handle two lines, those that split up their energy by attempting to market three or more, except in such houses as group several varieties of foreign makes or allied types of commercials, are unimportant in number.

The reason for this conclusion is that when the industry developed beyond the experimental stage it tended to become highly specialized not only in manufacture, but also in marketing practice.

There are two factory branches which handle both the pleasure and commercial lines with the same sales force from the same salesroom and seven branch houses and agencies which have both lines but which conduct them separately as to showrooms and salesmen. The remainder center attention on a single line, except as has been noted with reference to the foreigners and the allied lines of commercials, such as the LaCroix agency for foreign cars and the International Motor Company and General Motor Company.

Tendency Is Toward Segregation

Such makes as Packard, Pierce and Peerless handle both lines from their local establishments, but the departments are kept separate with scrupulous care. The White Company is an example of the other phase of the situation where the two types of the automobile art are handled indiscriminately.

The tendency is toward separation and centralization of effort upon a single objective point. The arguments of those who follow such procedure as the White Company are that the fact of handling trucks and pleasure automobiles of one make does not constitute the scattering of energy to any material extent while it does embrace certain special advantages. The main elements of these are that where a business man has purchased an automobile for his personal use and is satisfied with its performance, he is likely to be prejudiced favorably toward the line of trucks manufactured by the same company as turned out his pleasure car. Numerous instances are cited by companies that conduct their business in this way to show that the identical salesman who conducted the sale of the pleasure car in the first instance is the best man to handle the commercial negotiations and in some cases the only man who can do so under the circumstances.

The concerns which separate the two departments argue that bankers, brokers, lawyers and other professional classes which constitute a very large proportion of their total customers, are not interested in trucks. That any energy diverted from the selling of pleasure cars is not counterbalanced by an equal or greater gain in efficiency in selling trucks. That the business men who are interested in trucks may have no interest in pleasure cars, and that while there is a certain advantage in having the successful salesman of a pleasure car conduct the negotiations for truck sales to his own customers, in other respects the idea is not economical.

Among the companies that handle a single variety of automobiles or trucks the idea of centralizing effort is more pronounced than it is in any other type of automobile selling. While there are dozens of such establishments in New York, such as the Abbott, Oakland, Pullman, Moon and Cadillac, the experience of the latter concern is a strong illustration. The Cadillac salesmen are massed to sell one car. They are carefully schooled in the features of their wares, as, in fact, are all the more efficient salesmen of the present. But, in addition to knowing their own car, they are cautioned that the less they know about competitive lines the better will be the results attained.

Their motto is that comparisons are odious; let the other fellow do the comparing.

Both Ideas Have Their Advocates

Within the past year several companies that have had the selling agencies for trucks of different makes than the pleasure cars handled by them have abandoned them because of the radical difference found in the clientèle of the two branches of the automobile business and the amount of specialization required by the salesmen.

They learned that the truck salesman must be a scientist, diplomat and business man rolled into one individual and that when such a combination exists it would be a shame to require him to follow the routine of the average salesman of pleasure cars. On the other hand, they found that the average run of pleasure car salesman is about as far from availability as a truck salesman as it is possible to be.

Maintenance guarantees are not the rule in selling pleasure automobiles, but at the present stage of the industry, operative and maintenance costs as estimated and stated by truck salesmen before sales are a distinct factor. Such procedure may be poor business, but in viewing things as they are, it can not be avoided.

The regular manufacturers' guarantee as to material and workmanship is all that is required of the concern selling pleasure cars. This varies to some extent, running from 90 days to life, and with it the salesman has but little to do. While the usual truck guarantee is couched in somewhat similar general terms as covering these points, the salesman is obliged to show operative and maintenance costs down to the mill per wagon mile and in many instances must guarantee such costs as well as the working of the truck in service.

Unjust as such practice may seem, it is a fact, and dealing with the fact guesswork on the part of the salesman might prove disastrous to the company. Therefore, a much more extended knowledge of all those factors is required of the truck salesman than of his brother in the pleasure car end of the business, just as the pleasure car salesman must possess certain other qualities applicable to his line which would be wasted in the truck trade.

Summed up, the reason for segregating the branches of the automobile industry is based upon the diametrically opposed character of the trade and the reasons for conducting the sales of trucks and cars with the same force and from the same salesroom in the particular instances where that plan has been used with success, is that there is a material relation between the buyers of pleasure cars and trucks. Both views are perfectly tenable from the standpoints of each class of sellers and the reasoning of both is identical up to the final conclusion.

Communications from the Manufacturer

G. W. Dunham, of the Chalmers Company, Claims That S. A. E. Formula for Rating Horsepower Does Not Do the Modern Motor Justice

WHEN a mathematical formula will not give the right answer, it is time that formula was abandoned. When the A. L. A. M. or S. A. E. formula for rating horsepower will not give the horsepower which an engine will actually develop, it is time another method of figuring was adopted.

There is but one kind of horsepower, and that is work accomplished. There is but one way definitely to measure one horsepower—that is by lifting 33,000 pounds 1 foot per minute. One horsepower in an engine is the capability of doing work equal to lifting 33,000 pounds 1 foot per minute.

For instance, a man lifting 33,000 bricks, each weighing a pound and setting them on a platform 1 foot high in 1 minute, would be doing one horsepower of work. If, by means of a hoisting device, he could raise a block weighing 33,000 pounds. 1 foot a minute, he would be doing work equal to one horsepower. Whether it is a man, a steam engine, an electric motor, or some other means of power, one horsepower represents exactly the same amount of work.

In a high-speed gas engine, such as is used in an automobile, the horsepower varies. In the case of the man-lifting bricks, the faster he works, the higher will be his horsepower rating. The same is true of engine work. Thus, an engine developing a certain horsepower at 300 revolutions per minute will develop very much more at 1,000 revolutions per minute and still more at 1,500 revolutions per minute. If properly designed, its horsepower development will be still greater at higher speeds.

It is therefore obvious that, in rating an engine of a certain size, the speed of the engine has a direct bearing on the horsepower rating. An engine with four cylinders, each of which is 4 inches in diameter, with a stroke of 4 1-2 inches, could be given any number of different ratings. Each might be accurate for the speed at which the engine was running when the horsepower was rated. It could be truthfully stated that such a motor was a 12-horsepower motor, if rated at 600 revolutions per minute; or you might say that it was a 20-horsepower motor, if it was rated at 1,000 revolutions per minute; and if it was rated at 1,200 revolutions per minute it could accurately be called a 25-horsepower motor.

Theoretical vs. Practical Rating

It is necessary for comparative purposes to set some speed at which a motor should be rated. Again, there are two ways of rating a motor at a given speed—one is theoretical and the other practical. A theoretical rating may be obtained by figuration, by using a certain formula to arrive at the horsepower.

In some instances, the use of such a formula is the only possible means, as in deciding what size of motor would be required to do certain work. Yet, at best, the formula method is rather misleading.

Where the motor is already in existence, there is a second means—that of testing the motor for horsepower. This means is positive and practical. The motor is connected with a testing apparatus, run at a certain speed, and the horsepower is actually measured.

The Royal Automobile Club of Great Britain some years ago decided upon a formula for computing horsepower which was later adopted by the engineers of the mechanical branch of the A. L. A. M. This formula, rating the motor at 1,000 feet piston speed, was decided upon, in this country at least, by a comparison of results of horsepowers obtained in actual test from numerous motors of various sizes and compressions.

By 1,000 feet piston speed is meant a motor running at such a number of revolutions per minute that the piston will move up and down in the cylinder at the rate of 1,000 feet per minute. For instance, if the stroke were 6 inches, the piston would travel down 6 inches and up 6 inches with each revolution of the motor, i.e., it would travel 1 foot with each revolution. Thus, in that motor, at 1,000 revolutions per minute, the piston would travel 1,000 feet. If the stroke were less than 6 inches, the motor would have to run faster than 1,000 revolutions per minute, and *vice versa*.

This formula was adopted several years ago, and great strides have been made toward motor efficiency since that time. There is something wrong with a motor today that will not develop 50 per cent. more horsepower than its rating by the A. L. A. M. formula. Such a rating is neither doing the motor justice, nor giving the parties interested an accurate idea of the power developed. There is, therefore, a necessity felt for a new rating by which motors of different sizes may be compared. At the present time there is no such formula and there is no standard speed. Various makers are rating motors of the same size at different horsepower, according to the speed upon which they base their calculations.

Explanation of Chalmers Method

In the case of the Chalmers motors, although the old A. L. A. M. rating would not be reasonable, it was thought desirable to stick as close to the once-accepted formula as possible. The most reasonable workout seemed to be according to the old motor speed of the A. L. A. M. formula, and actually test the motors at 1,000 feet piston speed.

Therefore, Chalmers motors are tested at 1,000 feet piston speed per minute, and the horsepower is determined by actual measurement.

The Chalmers 36 develops, as an average, 36 horsepower at 1,000 feet piston speed, or at 1,143 revolutions per minute. Yet, by the A. L. A. M. rating, its horsepower is only 29. The Chalmers Six develops 54 horsepower under the same conditions, but by the A. L. A. M. rating its horsepower is only 43 1-2. Thus, the inconsistency of the old A. L. A. M. formula is apparent.

On the other hand, it would be possible for us to test our motors, as some do, at 1,500 revolutions per minute and claim over 40 horsepower. I know of one instance where a motor of less bore and stroke than the Chalmers 36 is given a higher rating. This is obviously unfair both to the manufacturer who rates his motors at the accepted 1,000 feet piston speed, and to the purchaser who accepts as truthful a manufacturer's rating of his motor. Personally, I consider all ratings made at other than 1,000 feet piston speed distinctly misleading unless the revolutions per minute is given.

Rating the motor in the actual test at 1,000 feet piston speed seems advisable, as this is about the speed of the motor in ordinary actual use. This is obvious, upon consideration, inasmuch as the large motors, with longer strokes, will allow the car to be geared higher so as to let the motor run slower for a given speed of the car than would be possible with a small motor.

GEORGE W. DUNHAM, *Chalmers Motor Company.*

THE OTHO Motor Company, of Boston, Mass., has just reported that any type of storage battery may be used in connection with their starter, which was described in THE AUTOMOBILE for August 22. It was stated in the description that Exide batteries alone were of service with this starter. The demands of the starter are a relatively high amperage sustained for a short length of time as distinguished from a lighting current where a continuous flow at low amperage is a necessity.

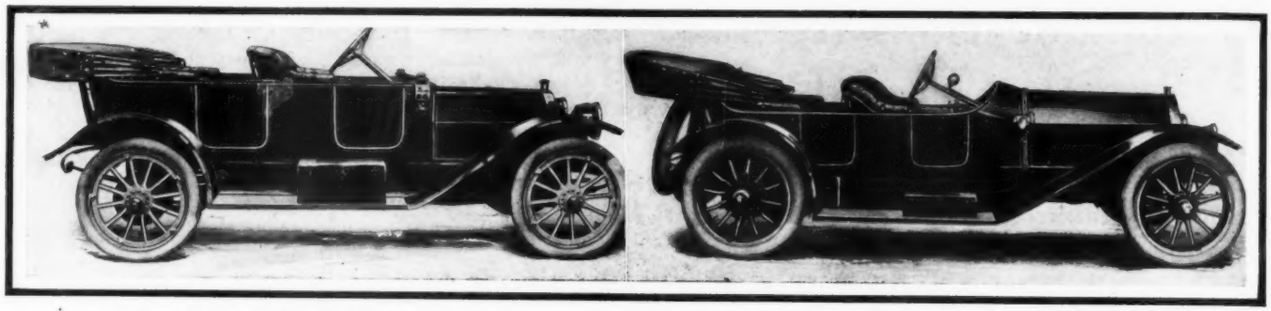


Fig. 1—Halladay model 32 touring car for 1913

Fig. 2—Six-cylinder model 50 with toy tonneau

Halladay Model 50 Is Now Six-Cylinder

Four-Cylinder Model 40 Is Continued with Minor Changes While the 1912 Model 30 Becomes 32

Long-Stroke, L-Head Motor, Developing Over 40 Horsepower, S. A. E., Is Used in Model 50

THE announcement of the Streator Motor Car Company shows that another American maker has joined the ranks of those who are making six-cylinder cars for the season of 1913. One of the models of this concern has been changed in bore and stroke as well as in number of cylinders and makes the sole six-cylinder car that will be produced for 1913. Other than the necessary changes incorporated in this car which has grown from a four to a six there are no mechanical changes of importance noted in the Halladay line for 1913. This year the three chassis were named the 50, 40 and 30; next season there will be the 50, 40 and 32. Model 50 has now six cylinders; model 40 is continued with minor refinements and model 32, the outgrowth of model 30, remains unchanged except for small body alterations.

The model 50, around which chief interest settles owing to the remarkable trend towards little sixes for the coming season, is equipped with the latest Rutenber six-cylinder motor. It has a bore of 4 1-8 inches and a stroke of 5 1-4 inches. The cylinders are of the L-head type and are cast separately, as may be seen in Fig. 5, where the left or valve side of the motor is shown. The cylinder castings are of soft grey iron and have the valve cages cast integral with the water jackets. The pistons are of the same material as the cylinders and are fitted with four rings. The latter have square-lapped joints and are distributed near the top of the piston, three of them being above the piston pin, while the other is in the same plane as the pin, serving both as a piston ring and as a guard against the possibility of the wrist-pin working its way longitudinally through the piston and bearing against the interior of the cylinder. The piston pins are made from hardened and ground steel tubing with phosphor-bronze bushings.

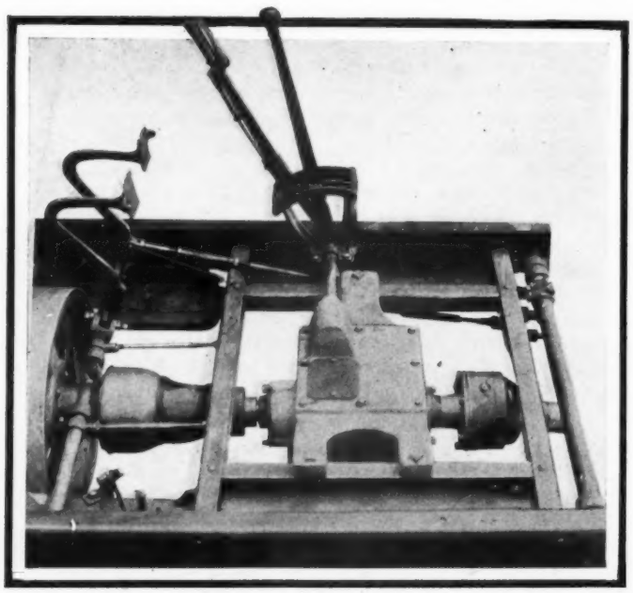


Fig. 3—Control mechanism on the model 32, showing the suspension of the gearbox

The entire valve action in this motor has been given special attention and is worthy of study as it has been made thoroughly up to date and typical of modern valve practice. The camshaft is placed in the same horizontal level as the crankshaft and by this arrangement there is no idler wheel between the camshaft drive wheel and the wheel on the end of the crankshaft. The teeth on these wheels are helical in form and carefully made to insure silence. The camshaft is a drop forging with integral cams.

Camshaft Has Large Bearings

The shaft is mounted on four large bearings lined with die-cast bronze bushings in two parts, which may at all times be taken up should wear occur. The valve tappets are actuated by a specially designed system which has been followed out with the idea of securing the utmost silence at this point. The actual valve follower is a roller which is carried in the center of a short lever pivoted at one end to a special boss which is a part of the crankcase. The bottom of the valve push-rod rests upon the other end of the short lever. Since the cam is applied between the fulcrum and the push-rod the lift on the latter is twice that of the cam follower, which gives a relatively quick opening and closing of the valve as well as a maximum total lift.

As far as adjustments go on the valve action it is only necessary to drop the bottom of the crankcase to expose the whole mechanism to view and enable any one making repairs or adjustments on this part of the motor to reach any desired part. The valve lifter fingers may be removed in pairs from beneath the crankcase and the lower halves of the camshaft bearings may also be taken out singly if desired.

The connecting-rods are long drop forgings with bearings of ample dimensions at each end. The bearings are lined with a special die-cast babbitt material and are split horizontally. Seven main crankshaft bearings are used. They are carried on bridges supported by the upper half of the crankcase. Adjustments on these bearings are made by removing the bottom of the crankcase in the same manner as for the adjustments on the camshaft bearings.

The oiling scheme is a combination of the force-feed and splash systems. The oil is contained in the base of the crankshaft, which is divided into two parts. These two parts are separated by a horizontal partition which forms a cover to the oil reservoir located in the bottom and also a foundation upon

which rest the oil troughs necessary in the oiling arrangement. The capacity of the oil reservoir is in the neighborhood of 2 gallons. The oil is drawn from the reservoir by means of a gear pump driven off the camshaft and housed within the crankcase. This pump takes the oil through seven independent leads to the bearings of the crankshaft and sends the lubricant into these bearings under pressure and in great quantities. The oil flows out of both ends of the main bearings, which are the only ones taken care of by the forced feed. The lubricant flowing from the main bearings furnishes the source of supply for the splash, as it runs into the splash troughs which are located below the throw of each crank. As the cranks sweep around a sufficient quantity of oil is scooped up by the bottom of the connecting-rods to lubricate the interior of the cylinder, the camshaft bearings, connecting-rod bearings and timing gears. The entire crankcase is filled with an oil mist which is sufficient to take care of all the bearings in the interior of the crankcase.

Provision for Overflow of Oil

As the oil is supplied to the crankcase more rapidly than the main bearings and the splash systems take care of it, there must be some means of overflow. Standpipes are provided which permit of a flow of the lubricant back to the crankcase whenever it tends to rise above the level of the splash troughs. The oil re-enters the reservoir and is then ready to be used over again. Before again passing to the suction side of the pump, however, the oil is passed through a strainer of fine-meshed screening which will take out the impurities to a great extent. In addition to this the oil supply should be thoroughly renewed every month. An oil indicator shows the level in the reservoir.

The cooling system is taken care of by a large centrifugal pump mounted on the same shaft as the magneto on the right side of the motor. The pump and magneto shaft is driven by a separate gear and carries at the end a pulley wheel from which the fan is driven by a belt. The fan is made of aluminum in one piece and has six blades. A cellular radiator is the remaining factor in the cooling system.

Two entirely independent systems of ignition are used on the model 50, there being no connection at all between the two systems. One system is through a Bosch high-tension magneto, while the other system consists of a set of batteries, coil and distributer. As has been indicated, the Bosch magneto is carried on the same shaft as the water pump. A special connection between the water pump and the magneto sides of the shaft allows either of these two instruments to be removed separately and independently from the other. This shaft is lubricated by grease cups on the ends of long stems which render them particularly accessible when the hood is raised.

A cone clutch is used on the model 32. It is shown taken down in Fig. 8. Leather facing is used on the driven member, which is shown along with the universal joint on the rear

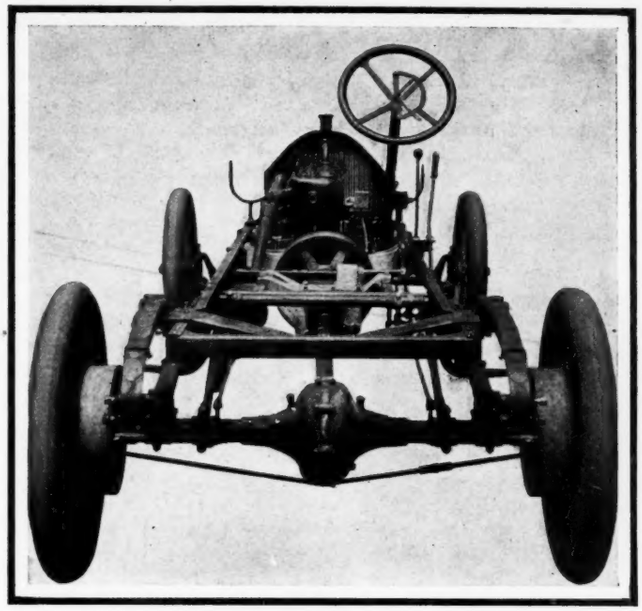


Fig. 4—Rear view of the model 32, showing suspension and details of chassis construction

of the short driven shaft in the illustration just referred to. From the clutch the drive is transmitted to the gearset, which is located amidships. The suspension of the gearset is particularly rigid as two independent transverse members are made use of to carry the weight of this part of the transmission. This system of supporting the gearset is shown in the chassis view, Fig. 4. As may be noted, they are of deep channel section and have the advantage of not only supporting the weight of the gearset, but of also protecting the entire framework against racking strains. Four forward speeds and one reverse speed is given by the gearset used on the six-cylinder car. The highest speed is geared higher than direct drive having a final ratio of 2 3-4 to 1, while the direct drive has a final ratio of 3 1-2 to 1. According to the usual usage the direct drive will be the more often used in this case, while the higher speed will become handy for work through open country on very good roads where the high gear ratio may be conveniently used.

Annular ball bearings are used throughout the gearset, while the gears themselves are of chrome vanadium steel. The shafts are of the same material as the gears and are carried on closely spaced bearings. The universal joint between the gearset and the propeller shaft is of extra large size and will permit of considerable disalignment between the shaft and the axis of the

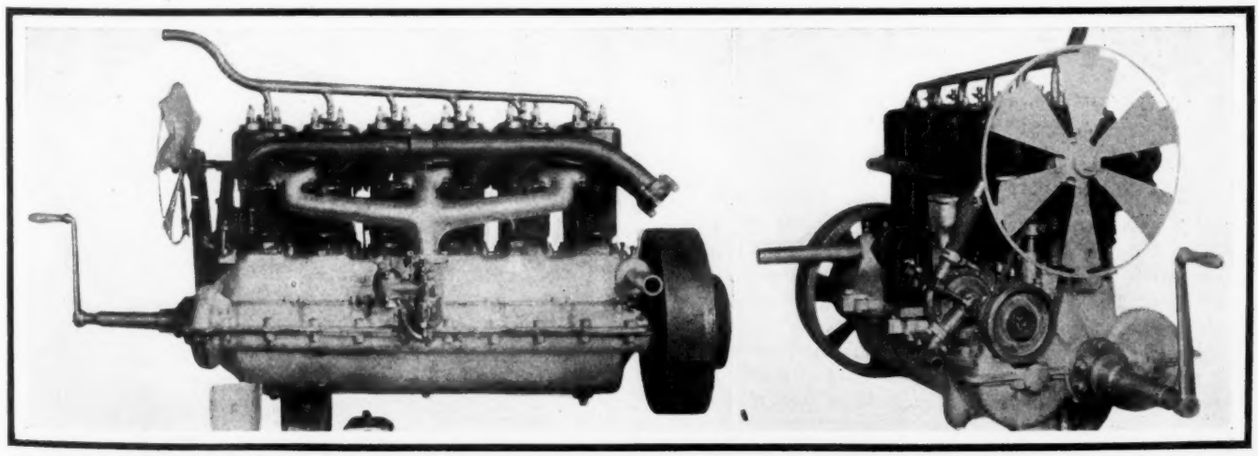


Fig. 5—View of the left side of the motor used on the Halladay model 50, showing the manner in which both intake and exhaust valves are inclosed. Fig. 6—Quarter front view of model 50 motor

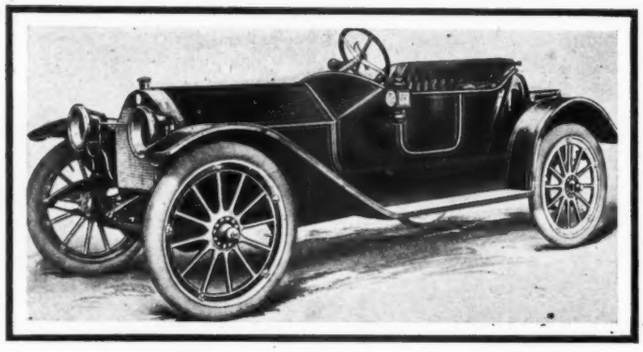


Fig. 7—Halladay 1913 model 40 equipped with roadster body

gearset shaft. In order to take care of the large bearing surface in this universal joint a grease cup is mounted upon it. The cup can be reached by lifting the floor boards just below the driver's seat. The propeller shaft is inclosed in a torque tube of generous size. One end of the torque tube terminates at the forward universal joint, while the rear is fastened to the differential casing on the rear axle.

A floating rear axle supported by a pair of radius rods, also visible in Fig. 4, transmits the power to the road wheels. The axle is carried entirely upon annular ball bearings. The housing of the rear axle which under the floating construction carries the weight of the car is of pressed steel joined in the center. This connection is shown in Fig. 4. In order to reach the differential wheels for the purpose of making adjustments or repairs it is only necessary to remove the eight bolts from the housing, when the entire rear system may be disassembled. Two grease cups are mounted on the differential housing to take care of the annular ball bearings. A strut rod, which is adjustable for tension by means of a turnbuckle, relieves the axle to a large extent of sagging strains and makes the structure in the rear more rigid.

There are two sets of brakes. They are both of the internal expanding type acting on the same band. The springs are three-quarter elliptic in the rear and semi-elliptic in front. All the spring shackle bolts are fitted with integral grease cups. In fact, as may be noted in the chassis view, special attention has been paid to the placing of grease cups through the wearing part of the chassis. The frame members are of straight channel without a drop or toe-in throughout their entire length. The side members are amply supported with deep transverse pieces connected gusseted joints. An irreversible steering gear is used on this car. There are two wheelbases for this model, 134 inches on the seven-passenger type and 128 inches on the four-passenger cars. The tires are 36 by 4 1-2 inches all around.

Model 40 of the Halladay line begins its third season without constructive change but with several refinements in details of body and equipment for 1913. In it is used the same size of motor as in the 50 except that there are four cylinders instead of six. Aside from dimensions of the parts, the construction is almost the same as that of the six-cylinder car. The wheelbase is 118 1-2 inches and the tires are 36 by 4 inches.

Model 32 Has Long Stroke Motor

Model 32 is almost the same as the 1912 model 30. Either a Rutenber or Continental motor is supplied. This is of the long-stroke type with a bore of 3 3-4 inches and a stroke of 5 1-4 inches. The details of construction of the Rutenber motor of this size are the same as those of the larger model already described, while the construction of the Continental motor is similar in many respects. Except for dual instead of double ignition, the general design of the car is the same as that of the larger model.

There is one point about the construction of the 32 motor that is worth emphasizing and that is the size of the camshaft bearings. These are so large that the entire camshaft, cams and all, can be withdrawn through the bearings without removing the latter. The cylinders are offset 1-2 inch from the crankshaft to give maximum torque with minimum friction. The Briggs dual magneto is used. The wheelbase is 112 inches and tires are 34 by 3 1-2 inches front and rear.

Two types of bodies are supplied on the model 32, a five-passenger touring and two-passenger roadster with trunk and gasoline tank on the rear deck. A neat arrangement is used for carrying a spare demountable rim and tire at the rear of the car. Three rigidly supported brackets from the body and frame grip the rim so that no straps are necessary, and the rim and tire are held rigid with no chance for the tire to chafe, as there is nothing with which it can come in contact except the rim on which it is inflated. The cars are all equipped with a provision for adjusting the carbureter from the seat and with ventilators in the dash.

Three bodies are fitted to the Halladay 40, a five-passenger touring, a four-passenger toy tonneau and 2-horsepower roadster. In its external appearance the 40 has been modified somewhat for greater refinement and comfort. The fender lines have been greatly improved. The running boards are made wider and thicker and covered with a very heavy cork carpet and nickel binding. Black and nickel finish has been made the standard. The upholstering has been increased in thickness and 8-inch cushions are used. Foredoor ventilators, demountable rims, dash control on carbureter and the special spare rim holders are furnished as standard equipment. The car also is electrically lighted throughout, the current being supplied by silent chain-driven generator when the car is in motion, and by storage battery when the car is standing still.

The two bodies fitted on the model 50 include a seven-passenger touring car and four-passenger toy tonneau; the equipment is the same as that on the 40.

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Credit to Reference Works

In the two articles entitled Metric or English Measurements? which appeared in the issues of August 22 and 29 of THE AUTOMOBILE, credit should have been given to the following publications: W. Hallock and H. T. Wade, Outlines of the Evolution of Weights and Measures and the Metric System; F. A. Halsey, The Metric Fallacy. The parts and figures regarding the two systems of measurement as given in these works proved of great assistance to the author of the articles mentioned.

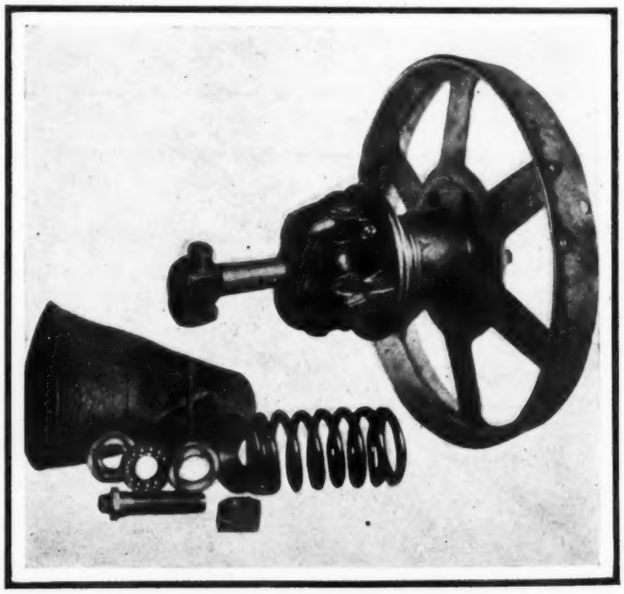


Fig. 8—Cone clutch on model 32, showing leather facing and liberal size of universal joints

Disco Starter Improved

Model 16 Possesses Several Refinements Designed to Make It More Certain in Action and Easier to Operate

Distributor Valve Altered to Produce a Better Mixture Ratio—Engine Valve Self-Cleaning

THE Disco starter which will be seen on several prominent cars bearing the 1913 date will have several changes for the coming season. There is no difference in the principle involved in this starter which is of the acetylene type, but the distributing valve by means of which the gas is directed to the motor cylinders has been changed to a considerable extent. The engine valve is now a combination check valve and priming cock which involves a self-cleaning feature. These two new parts with the refinements involved in each represent the changes which have been made over the starter of last year. The model is to be called the Disco 16.

The new distributing valve is similar in principle to the one used on the original Disco starter but the operation is different. With the new distributer needle valve the distributing operation is performed by opening and closing the valve apperture by turning the handle to the right and then back to the closed position. The valve handle as it appears on the dash and also with the dash plate removed is shown in the accompanying illustration. When the starter is not in use the handle must be left in the off, or closed position, which is perpendicularly downward. As the valve is closed when the handle is down it will not be possible for the vibrations and jars to which the car is subject to shake the valve open. The handle is weighted sufficiently to hold it safely in the closed position.

New Valve Gives Two Charges

The valve employed in the past was of the same type but had to be given a continuous turn for one rotation. The new valve gives two distributing charges instead of one on opening and closing the valve handle and a mixture of the correct proportions, it is claimed, will surely be forced into the cylinder by this method. Last year, if it was desired to start the motor while cold it was necessary to turn the handle of the valve two or three times and it was found that there was a tendency among users to give the cylinders more gas than was needed even when cold. With the double charge distribution used on the model 16, it is thought that there will seldom be occasion to turn the handle more than once to the right and back.

The engine valve which involves the priming cup and self-cleaning feature is shown to the extreme right of the illustration. In the past models the priming cup was used in conjunction with the engine valve but the self-cleaning feature has been added for the model 16. When the lever is in an upright position as it is in the illustration, the engine check valve is in operation and is so placed as to admit gas from the distributer into the motor cylinders. The check valve will not, however, permit any of the gases from the engine to back through the tubing to the distributer as it automatically closes against pressure which would tend to return the gases in that direction. When the handle is turned to the left it opens a passage from the priming cup direct into the cylinders so that gasoline may be injected into the cylinders if desired, or the cup may be left open to blow out the cylinders by turning the handle to the right. When the handle is in the latter position the passage is past the ball check and is not closed to any degree by the check.

The weight of the Disco starter complete, exclusive of the acetylene tank, is approximately 4 pounds. It consists of the distributer valve, the engine valve, both of which have just been described, and the necessary copper tubing that connects the acetylene tank with the distributer and the distributer with the different motor cylinders. When the distributer handle is turned to the right and then back to its original position a current of gas has been allowed to flow into each cylinder. This acetylene mixes with the air that is in the cylinder and forms an explosive mixture. The range of explosion of acetylene is very large as it will explode when in the proportion of 63 parts of acetylene to a hundred parts of air all the way to three parts of acetylene with 100 parts of air.

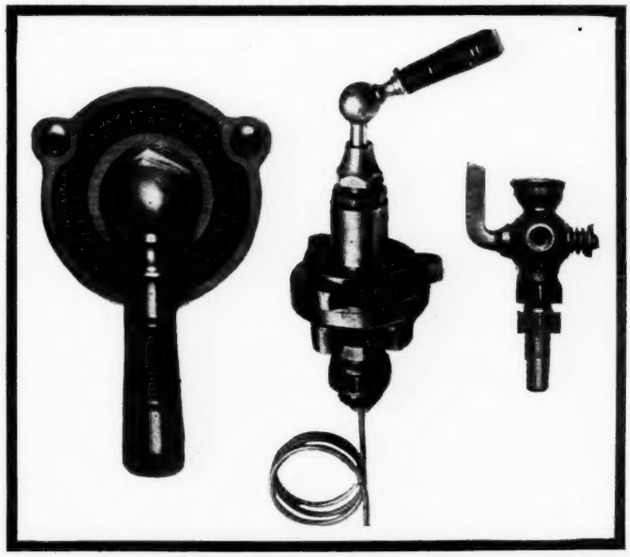
When the acetylene has been introduced into the cylinder it is necessary to fire it in the same manner that would be used in starting on the spark. The switch is turned on and the charge ignited. After the first explosion or two, the engine should pick up its own cycle and continue on the fuel supplied by the carbureter. As there is a charge of acetylene in each cylinder after the distributing valve has been opened, there will at least be four explosions from the acetylene alone, this should be sufficient to turn the engine over at least seven times.

Under Cold Weather Conditions

In cold weather conditions or after the car has been left standing for a long time in cool weather it will sometimes be necessary to put a heavier charge of acetylene in the cylinders or even to run the car on acetylene until it becomes sufficintly warm to run on the carbureter. To run the motor on the acetylene it is only necessary to keep the foot against the handle of the distributer valve, keeping it in an open position so that the gas has access to the cylinders.

In order that the starter will work satisfactorily it is necessary that the engine should balance, that is, at least one of the cylinders must be in a firing position so that when the ignition is switched on there will be a spark in one of the cylinders.

The installation of the Disco starter requires the replacement of the ordinary compression cock by the priming cock and valve previously described and shown in the illustration. The distributer valve is attached to the dash in some convenient location for starting and the copper tubes are run from the distributing valves down the engine valves. The standard valve attached to the acetylene tank is then removed and replaced by a special two-way valve, the larger tube of which is connected to the lamps while the smaller takes care of the starter. The copper pipes are then connected so as to give a flow from the tank directly to the distributing valve. After the lamps have been connected up and all the joints in the tubing made tight the starter is ready for use.



New Disco distributer valve, with and without dash plate; improved model 16 engine valve with self-cleaning feature

Movement for Domestic Motor Fuel Started in Germany to Oust Gasoline—What Mufflers Should Do and How—A Proposed Piston Improvement—Ten Years of Progress in French Automobile Construction Outlined By Expert

ROYALTY Urges Benzol for Fuel—Under date of July 25 Prince Henry of Prussia issued a call to German owners of automobiles exhorting them to turn to benzol as a motor fuel, mostly for patriotic reasons, and it is predicted that this call from the brother of the Emperor and the most influential patron of automobilism in the German-speaking countries will not pass unheeded. In the United States the benzol produced at gas and steel works from bituminous coal is used largely for enriching illuminating gas or is turned back into the heating processes incidental to steel production, while that contained in coal tar is largely wasted at present, but the question of a much-increased production of this fluid is also here entering upon the order of the day, since the price of gasoline has been increased about 33 per cent. during the past six months, and because the demand for benzol for the chemical industries is growing with the advancement of the latter, while coal tar is now required in large quantities for road improvements and for this purpose is more valuable the less benzol it contains. Under these circumstances the German attitude to the subject, as voiced by Prince Henry, becomes a matter of interest, even apart from its probable influence on the design of carbureters for automobiles intended for export to the German market. Prince Henry covers the subject as follows:

"Lately new tests have been made with benzol with a view to the displacement of the foreign product benzine (gasoline) by German-made benzol. A 40-horsepower Benz car was driven, for example, 669 kilometers from Hemmelmark near Kiel to Friedberg near Frankfurt am Main at an average speed of 40 kilometers per hour, and the fuel consumption was only 109 liters of benzol. A 100-horsepower Opel car was driven 680 kilometers, from Frankfurt am Main over Bochum, Dusseldorf, Cologne and back to Frankfurt, at 60 kilometers per hour, using 138 liters of benzol. The fuel efficiency was thus found to be at least equal to that of benzine. And as benzol costs only 24 pfenning per liter as compared with the present price for benzine of 45 pfennig per liter, a saving of nearly 50 per cent. is established.

"Several technical objections were formerly raised against benzol, such as soot formation and overheating of the cylinders. But these troubles can be obviated by suitable modifications of the carbureter, giving an increased air supply. The above mentioned tests, in which the heat generation and soot formation were normal, were made with a "Favorit" carbureter, which is designed especially for benzol. The high freezing point of benzol can be materially lowered by a small admixture of benzine and therefore constitutes no drawback. Of interest, and at the same time an argument for the suitability of this fuel, is the fact that so far more than 20 per cent. of the German benzol output has been exported for use in French automobiles.

"The national interest constitutes however the center of gravity in this matter. The prices of benzine are dictated to us from abroad, especially from America. German automobilism is at present completely dependent upon importations, and this means a great national danger in case of war. Every automobile owner should—entirely apart from the pecuniary saving involved—contribute his share toward a more general employment of benzol which is produced from German coal by German workmen and German engineers, so that in an emergency the benzol industry may be enabled to take care of Germany's needs. Through private negotiations, the German Benzol Society at Bochum, representing the united benzol industry, has with laudable patriotism declared itself prepared to guarantee that the price of benzol will not be raised within a measurable future, even though a strongly increased demand should raise its cost of production by making it impossible to turn out a sufficient supply as a byproduct.

"Therefore, German automobile owners, drive with benzol!" (Signature of Prince Henry).—From *Automobil-Betrieb,* middle of August.

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Mufflers Which Increase the Power—In the agitation against the wanton use of muffler cut-outs on automobiles and motorcycles and the total absence of mufflers in aeroplanes and motor boats, the argument offered by those whose earsplitting practice gives offense is mainly based on the assertion that the muffler consumes power and tends to overheat the motor by retarding the escapement of the exhaust gases. L. Ventou Duclaux, one of the engineers connected with the testing laboratory of the Automobile Club of France, writes interestingly on this subject, in part as follows:

When the cylinders of a motor are fitted with exhaust pipes of a few centimeters in length, the burned gases which are expelled under pressure at the moment when the exhaust valve is raised from its seat strike the atmosphere at once. A clash is thereby produced to the right of the exhaust orifice, and it is this clash of gases which makes the noise. There is also established a counterpressure which has the effect of hindering the evacuation of the cylinders. Any expedient which serves to reduce this counterpressure results in reducing the noise of the exhaust.

On the other hand, if the escape of the burned gases is assisted in any manner it is possible to avoid losing power at the same time as the noise is reduced, and in certain cases power may even be gained through the suppression of the noise Already several years ago Mr. Lumet proved by tests made in the laboratory of the Automobile Club that for any given speed of a motor it was possible to add a little to its power by fitting it with exhaust pipes of a certain length. The muffler contest of 1905 had previously demonstrated that a certain muffler pattern dampened the noise without absorbing power but also that the majority of mufflers consumed a notable percentage of the motor power.

The muffler problem comprises two elements: (1) so far as the noise is concerned, to devise an apparatus which will make the burned gases empty into the atmosphere at a minimum speed and (2) so far as power is concerned, to promote the flow of the gases.

These two problems are usually solved simultaneously. It is sufficient to produce in an enclosed space of suitable capacity a decided cooling of the burned gases immediately at their exit from the motor. The cooling reduces their volume and consequently their speed. This cooling process must however not go beyond certain limits, as otherwise more power will be spent in producing it than can be gained from its effects. It can be brought about either by expanding the gases suddenly in a considerable space or by making them pass through tubes surrounded with circulating water. The same result can be obtained by circulating the hot gases in contact with baffle plates which absorb some of their heat, and leaving it to the apparatus to get rid of the heat by radiation. But in apparatus of this class power is necessarily consumed, since they block the exhaust more or less. Some constructors have also tried to reduce the speed of the hot gases by directing them into jets with opposed nozzles and playing one stream against another, creating eddies, but this method has not given good results.

In order to obtain the best results it seems necessary to cool the gas as much as possible while leading it out with a minimum of friction against the walls of the apparatus. It is consequently useless to aim for a radical cooling of the gases, for this cooling takes place so much more slowly as the difference is less pronounced between the temperature of the gases inside of the piping and that of the atmosphere, and experience shows that the resistance caused by passing the gas through the long piping, which may be necessary to effect such complete cooling, means a power loss. In fact, mufflers have now been designed which choke the noise very well and at the same time add slightly to the power. Tests made recently by the Automobile Club of America on 4-cylinder motors showed that a muffler, the origin of which is left unmentioned, produced the following results:

At 300 revolutions 13.5 horsepowers, as against 13 horsepowers with open exhaust.

At 1000 revolutions 43 horsepowers, as against 41.5 horsepowers with open exhaust.

At 1800 revolutions 47 horsepowers, as against 46 horsepowers with open exhaust.

Still more recently tests have been made at the laboratory of the Automobile Club of France with a Galaine muffler which is composed of three concentric tubings. The tube of smallest diameter is open at both ends and forms the part which is fitted to the exhaust conduits of the motor. It is cut with slits at right angles with its axis. The second tube is pierced with holes. The third is external and has no apertures. The burned gases are divided in two portions. One follows a straight line and empties directly into the atmosphere. The other passes through the slits of the inner tube and the holes of the second one and mixes in the final discharge with those which have followed the straight course. Toward the end of the apparatus an ejector permits the escape of the deflected gases. The passage of the gases in the central tube creates suction, drawing gas back through the slits and holes and further facilitates the expansion and discharge of the deflected gases.

A Renault 4-cylinder motor, 75 by 120 millimeters bore and stroke, fitted with this apparatus developed 7.08 horsepowers, while with free exhaust it gave only 6.72 horsepowers, which represents a gain in power of 5.35 per cent, all the while the noise of the exhaust was very satisfactorily obviated.—From *La Vie Automobile*, August 17.

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Trémolières Piston—Representing one of the first rational attempts at the improvement of piston design, with a view to the reduction of friction and safeguarding of the compression, the Tremolières piston was recently mentioned in these columns (THE AUTOMOBILE, July 18), the description being taken from one of the French automobile publications, but it would appear from the illustrations reproduced herewith, which are of a more definite character, that the description first offered was incomplete or misleading in some details. The objects aimed at in the Trémolières design are the retention and equable distribution of lubricating oil over the whole rubbing surface of the piston, and the means adopted for this end are oil-retaining grooves, connected by cross-channels and a considerable reduction of the actual rubbing surface below the piston rings. Fig. 1 (1) gives a view of the complete piston (with the piston rings A released from the confining pressure of the cylinders, so that the ends of the rings do not meet). Fig. 1 (2) shows the relations between the cylinder wall G and the piston surface below the piston rings, and Fig. 1 (3) shows details of the piston rings and the oil channels *a*, *c* and *d*. Those marked *a* are circumferential grooves upon the rubbing surface of the rings, while grooves *c* connect one ring's oil supply with that of the next one and grooves *d* carry oil behind the rings. BB are oil retaining zones turned in the piston surface, so formed that the lower portion *b*1 of each zone acts as an oil retainer during the upstroke and the upper portion *b* likewise during the downstroke of the piston. CC are grooves connecting these zones. Only the lowest zone B1 is isolated. DD are the zones which remain in rubbing contact with the cylinder wall save for the oil films which the gas pressure and the resistance to the piston movements carry unto them from the adjacent oil-retaining zones. It is said to have been demonstrated that this construction—the weight of which, as compared with that of ordinary pisons, is not mentioned—has produced an increase of power and a velvety piston action in a number of French motors in which it has been tried.—From *Omnia*, August 17.

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Progress of Ten Years—An analysis of the changes which automobile design has undergone since it was first thought to be approaching finality is presented by the well-known engineer and editor, Charles E. Faroux, and is reproduced in the following with abbreviations.

It was during the first two years of this century that the operation of automobiles became sufficiently safe and regular to assure them their place among the standard means of transportation. Before that time all had been groping, and many automobiles of strange appearance were seen, but, as many will remember, from the year 1902 people began to recognize the different manufactures by the shape of the motor hood, which is equivalent to saying that other differences in the chassis became too inconspicuous to attract the notice of the general public. The age of refinements had begun. In looking backward over the period of ten years which has elapsed since, we shall see that certain organs of the automobile have been the object of a rapid evolution, that others have remained almost what they were, and that some, after undergoing various changes, have returned to the forms first given them.

The motor ten years ago was heavy and had small power,

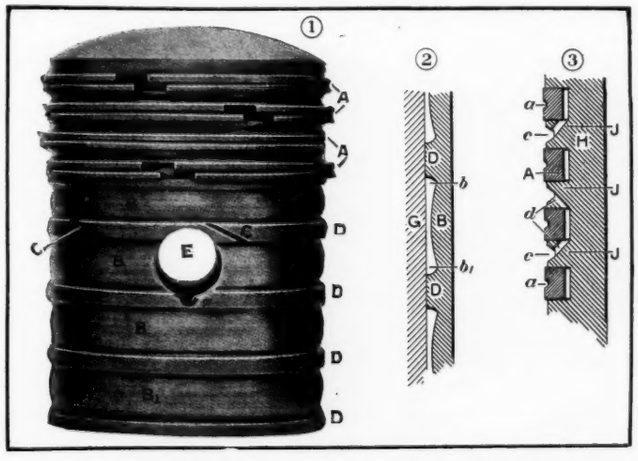


Fig. 1—The Trémolières oil-distributing anti-friction piston

low compression and small speed. It turned at from 750 to 900 revolutions per minute. Only a few single cylinder motors reached 1200 or 1400 revolutions and gave rise to technical arguments from which in course of time they have emerged victorious. Piston speeds and mean pressures were very low and the weights of reciprocating masses were considerable. The two-cylinder casting was the rule, the monobloc unknown. Admission valves were actuated by suction and the cam shaft gears were often exposed. The motor was regulated by blocking the exhaust on the hit and miss plan. Throttling was unknown. The unclutched motor turned in a series of spurts and checks, with the governor spasmodically tending to maintain a constant speed by the inadequate means just mentioned. Variations of the vehicle speed were obtained by maneuvering with the gear speed levers. The small 4-cylinder motor did not exist, and the number of cylinders was in practice determined by the power it was desired to obtain. Up to 8 horsepowers the motor had one cylinder, from 8 to 12 or 15 it had 2 and only above that 4. Six and 8-cylinder motors were in the state of samples or projects only.

Lubrication was effected by splash only. Variations related to the means for getting the oil into the crankcase—by hand pump, by gravity or by exhaust gas pressure. While valves were automatic, carbureters were not so. Their biblical simplicity included merely a float chamber and a jet. It was not till 1903 that Col. Krebs introduced automatic regulation of the gas mixture acting on the air supply, and later came the modern apparatus acting on the fuel, by which perfection is almost realized.

Ignition at that time was the nightmare of the chauffeur. Electricity by degrees triumphed over hot tubes but had for its source only dry or storage batteries. An ignition system for four cylinders involved a network of wires and of organs for the distribution and transformation of current which gave the driver many a sweet pause of perplexity. Low tension magnetos with wipe spark were placed in the market, but it was a long time before apparatus became known which would function for hundreds of thousands of kilometers without a murmur of trouble.

Vehicle frames existed in all possible variations excepting the one which is now standard; that of pressed steel. Panhard used armored wood. Charron forced wood into a steel tube which was afterwards rolled flat. Some used the rolled structural steels of commerce, but a large majority used the drawn tube borrowed from the bicycle industry, only larger. While strong and light, the latter did not lend itself well to convenient and sightly methods for mounting the various organs of the vehicle or the carriage body. The pressed steel frame first appeared in 1903 and gradually displaced all other forms. For axles, tubes were used and also solid oval or rectangular sections of forged iron or soft steel. The I-section came only with the Mercedes school of design which brought us annular ball-bearings, push-pedals, honeycomb radiators and multiple sliding gears with lateral displacement; also the modern form of the front wheel spindle and its mounting. Some firms continued to use adjustable ball-bearings, of the bicycle pattern, in the wheels up to 1906.

The rivalry between wood and wire wheels was sharp at this period, and the victory of the wood wheel seemed definite in 1903. Yet, the wire wheel returns now to give it battle again, but in demountable form and with many improvements. Vehicle springs were nearly what they are now, only shorter, more arched and less flexible. Often the rear springs were placed directly under the chassis, but on the whole the progress in spring suspension has been slight except in the matter of shock absorbers and elastic shackles which were unknown in 1902. [Shock absorbers were used on motor cycles and some racing *voiturettes* in France at that time, however, and auxiliary springs mounted as elastic shackles were known in the United States. The improvement in alloy steel spring materials which has taken place after 1902 would also seem to be so important a factor that the progress in spring suspension must be said to have been anything but slight or insignificant.—Ed.]

The cone clutch with leather facing was generaly adopted but was far from possesing the qualities which it has acquired since. It wavered between slipping and seizing. It was often mounted upon the transmission shaft and the cone easily came out of alignment with the flywheel. The clutch spring was usually supported on the motor shaft. The mounting of the cone on the flywheel axis, the equalization of the engagement and the interpositon of universal joints between the clutch and the gearbox were important improvements. The multiple disk clutches and the plate clutches were at the beginning of this period only projected.

Gear changes were in most cases made by the sliding gear system, though some belt transmissions still survived as well as some epicyclic gears actuated by expansion rings or brake bands. But the gearboxes gave three or four speeds by means of a single shifter, which made them very noisy by reason of the length of the shafts and the resulting vibrations. Peugeot, however, had multiple shifters controlled by cam grooves in cars with horizontal motors, which arrangement has been readopted in another form more recently. [The author refers perhaps to the cam-controlled gears in one of the Panhard motor trucks.—Ed.] But the lever with lateral displacement and its simple and direct control of the shifter forks was not known in France. Only the Mercedes cars were equipped with it. Direct drive on the high speed existed in Renault cars but was not general.

Bearings were usually of the parallel type and if ball bearings were used they were of the adjustable cone and cup pattern. The steels used in gears and for cutting gears were not those to which we owe the silence and strength of modern cars. The battle between chain and shaft drive had just begun, and the Paris-Vienna race, in which the light shaft-drive cars won, became the signal for the commercial victory of shaft-drive construction. It is notable that its first form was the same in the large features as that which won out recently at Dieppe: Two universal joints; the springs clipped to the axle; no push struts or torsion tube; all stresses transmitted through the springs.

As for worm drive it may be supposed that none had been thought of, but as a matter of fact a Dietrich car with horizontal motor was equipped with worm drive to each of the rear wheels, and Louet constructed a rear axle worm drive which he brought out in 1903. While the wheels and the cardan shaft drive seem to be returning to the forms in which they first appeared, other organs have remained practically unimproved; especially the brakes. Little has been done since 1902 to improve their efficiency. About 1904 the external camel's hair brake bands gave way to internal metallic brake shoes. That is about all. We still absorb the momentum stored in the fast-moving car by first transforming it into heat by means of friction. Braking by the motor has not yet become general, perhaps by reason of the cost of the required construction. The steering system was established so well in 1898 that the improvements effected since that date relate only to those refinements which make the guiding of a modern vehicle so easy. The steering post has been given more slant, the tie-rod has found shelter behind the axle, lubrication and facilities for taking up play have been provided where needed, but the general design remains unchanged.

From this brief synopsis of the changes which have come over the automobile during the past ten years it will be seen that, although the chassis in its external aspect differs but little from its progenitor of 1902, the sum total of improvements in the design of details coupled with the gains accomplished through the use of better materials and a complete revolution in production methods make the vehicle of 1912 stand apart from the earlier type as sharply as modern man is distinguished from the cave-dweller. And in this résumé no account is taken of the advances in the forms and conveniences of the carriage work.—From *La Vie Automobile*, July 27, August 10 and 17.

American Cars in England

Change of Opinion Regarding Our Product and Increased Sales Command Formulation of British Defense

Organ of English Industry Voices Sentiments and Ideas of United Kingdom's Manufacture and Trade

FOR the past few years, during which the average price of the American automobile has been lowered continually, the manufacturers of this country have made determined and concentrated efforts to break into foreign markets, especially those of Europe, Great Britain and Australia. They have been singularly successful in the case of the last-named continent, while their success in continental Europe has so far been rather limited. But in England, the number of American cars has been increased constantly of late, and this development has given rise to a serious agitation of the British industry and trade.

While, in the beginning, the Britons rested on the hope that the inferiority of the American product would soon stop and nullify the influx of such cars, as the British imports of American bicycles had lasted only a short time, the trade of the United Kingdom soon proved to be mistaken. As *The Motor* (London) recently remarked, the Americans had learned their lessons in the bicycle days and now profited thereby. The quality of cheap American automobiles is never out of proportion to the price paid for them, and, as a result, their market among the middle class is constantly increasing.

Our above-mentioned contemporary has analyzed the situation and has arrived at the conclusion that the American success in Great Britain is due to five reasons: (1) To the low cost of production and low price of the cars, which is made possible by the standardized production methods applied in their manufacture; (2) special inducement to the purchasers of the cars in offering them completely equipped machines, which gives the car the appearance of a bargain in another way; (3) the ample reserve power afforded by the use of relatively large power plants; (4) simplification of the mechanism, that is, power plant and driving units; (5) energetic business methods.

Merit of Our Product Recognized

The fact is, that, though for years American cars were called nasty and cheap, the British public has come to recognize that the Western product is not only a mechanism by the use of which one may gain automobile experience for little money before investing in a larger and more costly car of European or British make. The people have come to see that the American automobile is a low-priced but meritorious product, the cheapness of which is due to the great production of American plants and the standardized basis on which this production is attained. True, the low-priced American car is not on a par with the refined machines turned out by several high-class European factories; but, as the former gives satisfactory service and has a fair length of life, it appears to be worth the money which the British pay for it.

A connoisseur or expert will, in most cases, buy an automobile at any price, provided the quality of its material and workmanship warrant longevity. But even they do not buy with a view of keeping a car forever, and this would be the only condition under which the average purchaser could afford to invest in a high-priced car; so that every reasoning induces him to choose a low-priced machine. For him the American automobile is the solution of the problem, and the satisfaction which the buyers of these cars get out of their machines serves to constantly increase the sales of the latter.

The great engine power and simplicity of mechanism in American cars are bound to impress the purchasers favorably. In addition to the relative cheapness of American machines, these factors complete the democratic appearance which always attracts the average buyer. One more factor tending to strengthen this impression lies in the American business, that is selling methods which are named as the fifth large cause of the progress of American automobiles in Great Britain. The American salesman, shrewd and direct at the same time, and to whom salesmanship has become a science, is entirely different from his European confrere who always stands on a different plane than his prospective, either above or below him. The congeniality of the American salesman toward his customers is one of the largest factors in the introduction of United States products in foreign countries and is one of his greatest assets, which has proved valuable all over the world. His competitors may despise his methods, but they are all beginning to recognize their effectiveness, and ultimately will come to adopt them at least in some measure unless they desire to sacrifice their trade.

The English are beginning to see that nothing except concerted effort of all their automobile industry and trade could stop the American tide or turn it to advantage. As *The Motor* (London) says, the battle will have to be waged in every department from the designer to the advertising man and salesman. Americanization, vaccination of British effort with American ideas, is the only way of balancing the invasion of mass-produced automobiles. It will not do to merely build small and cheap machines which are miniature copies of the large, expensive ones; the lesson to be learned cannot be learned from any but Western teachers.

Automobile Business a Pioneer

It may be said that the coming of such a transformation as is foreshadowed by the British article cited several times, marks the beginning of an era of general introduction of American industrial and business methods throughout Great Britain and Europe. It is the era of scientific management, of maximum efficiency, of the most practical application of science which has been conceived by American business engineers under the pressure of American conditions. The foreign industries may not see the advantages of scientific management as yet, but they are bound to awake to them sooner or later and to avail themselves of this new key to the still unclosed gates of success. The start which we have, on this side, in this new line of effort, is sufficient to keep America ahead in the race, provided she keeps pace with foreign engineers and the work evolved by them.

And how is supremacy to be preserved by us? The first steps have been made; engineers are constantly traveling to Europe and Great Britain to study the developments of quality made by the engineers who are active there. This work must be continued and increased by established and developing engineers who not only visit the factories to study the results of foreign work, but also the mental methods by which transatlantic engineers develop their new ideas, by which they work out the improvements of present designs and constructions. If there is one field in which we have much to learn from foreign engineers, it is their methodical thinking methods, for it is only on the strength of this that European automobile engineers have been developing, during the last few years, mechanisms which have entirely changed the appearance and the construction of automobiles. Of course, it was not all their work, but their work, done in proportion to their number, was very remarkable.

What Will Be Required of Us

In competing with the British we have to proceed from quantity to quality, while they must go the opposite and more difficult way. It is for us to take prompt advantage of this fact. In doing so, we have a wide basis to build upon and whatever materials and tools and, last but not least, money, there is required in the developments we have to undergo, is at hand. But the well-determined effort to overcome our shortcomings and attain whatever necessary qualities we do not possess now, is all that is necessary for our success.

Checking Cars in Garages

There Are Two Ways of Keeping a Record of the Time When Cars Enter and Leave the Building

Checking Sheets and Time-Clocks Have Advantages if Utilized in the Right Way

MR. AUTOMOBILE OWNER: If you were to be summoned to court today and another car owner claimed that his machine was damaged in a collision with your machine last night; if you knew you had been at home last night and that proving an alibi for your car could save you the expenditure of a large sum of money for damages; would you be in a position to conclusively establish such an alibi? This case may not happen frequently, but such an incident may occur at any time. Is not the logical conclusion that an owner should know the whereabouts of his car during every hour of the day or night?

Mr. Garage Man: You are in a position to keep for the automobile owner entrusting you with the care of his car a full record of the time when his car enters and leaves your garage. He wants such a record, he needs such a record; and it is you, and only you who can provide it. It is your business to watch over his car while he is not using it. You may not be legally obliged to keep such a record for him, but knowing that service, complete and efficient, is the one basis on which you may build up a large and profitable business, you will not refuse his just demand. There is a choice of means and ways by which you may keep such records for your patrons, and the more elaborate and reliable they are, the more valuable will be the result of your effort to yourself and to your patrons.

There are two principal systems of recording the time at which cars leave their garage and return to the same. They differ as to the degree to which the personal equation is involved in their execution and to which the possibility of a mistake enters into them. The first system consists in the use of large sheets which are suspended on boards near the garage entrance and on which the number of every car and the name of its owner, together with the time, are entered every time the car passes through the door. The second system consists in the use of a daily clock card for every car in the garage. The time clock and card rack are in the charge of a special boy or clerk.

It stands to reason that both of these systems, if carried out with an efficiency of 100 per cent., work equally well. But in this case the second system has a considerable advantage over the first, mainly because once the cards are filled out with the name and number of every car, the clerk has nothing to do except to stamp them from time to time. In the first system, on the other hand, the name and number of the car, perhaps even the name of the driver, must be written on the sheet by hand, in addition to the time of the car passing through the door. This shows that in case of a large garage, where a car passes through the door every minute, the sheet method of recording cannot be kept up save at the expense of correctness, as the man entering the times on the sheet is bound to get very tired in a short time.

In selecting a time system several things have to be taken in consideration. These are:

1—The number of cars kept at a garage.

2—The average frequency with which the cars housed at the garage leave and enter the same, giving an idea of the average number of times a car passes out of and into the garage in a day.

3—The resulting average number of cars passing through the door during an hour of the average week day with average weather.

4—The class of patrons the garage caters to and their expectations of service; that is, the extent to which they expect the garage to keep tab on their chauffeurs.

The sheets used by various companies for recording cars entering differ greatly in the way the details of information are arranged on them, and we therefore refrain from illustrating a large number of them, giving only a few representative designs which contain practically every point brought up in connection with this class of records.

Number of Cars Served a Factor

It is a matter of course that the number of cars served by a garage has a large bearing on the design of a checking sheet. If there is a large number, say more than a score, of cars kept at the garage, there should be not more than one line a day devoted to each car.

There are patrons who are less particular about the whereabouts of their cars during the day than others. As a rule, however, an automobile owner prefers to know his car is in the garage when he is not using it; for, while there are some chauffeurs to whom one may safely entrust the car, these can hardly be said to be in the majority. Most owners are very positive about their desire to have no one except themselves use their cars. The more strict the patrons of a garage, the more positive and unfailing must be its records.

One form of recording sheet which is very elaborate and gives an opportunity to enter a car on four trips a day, that is, leaving the garage four times and returning, is used by the White

NO SMOKING
CHECKERS OFFICE
POSITIVELY
SALESMEN ARE NOT PERMITTED IN THE CHAUFFEURS ROOM OR ANY PART OF THIS BUILDING
EMPLOYEES OR OR ON DUTY NOT ALLOWED IN CHAUFFEURS ROOM.
JOSCELYN STABLE COMPANY

Entering the Joscelyn Garage, New York City, every car passes the checker's office where its time is recorded by a stamping clock

WHITE GARAGE
DAILY REPORT

DATE.....

NUMBER	OWNER	A. M. OUT	A. M. IN	A. M. OUT	A. M. IN	TAKEN BY	BROUGHT IN BY	P. M. OUT	P. M. IN	P. M. OUT	P. M. IN	TAKEN BY	BROUGHT IN BY

Form Y R 31 500 4-12

RECORD OF CARS

NAME OF OWNER	NAME OF DRIVER	TIME OUT	TIME IN	REMARKS

Form 1—Checking sheet used for its own cars by the White Company. Form 2—Checking sheet used for infrequent callers in the Packard establishment

company, 631 West Fifty-seventh street, New York City. This blank, Form 1, is 1 by 2 feet, is of white paper, ruled with red and blue lines. It provides a space for entering the name of the car owner, that of the chauffeur if he drives the car, and the license number of the car.

Form 2, which is shown under Form 1, is used by the Packard Motor Car Company, of New York, for cars coming in for repairs. The names of the owner and driver of each car are entered on this sheet, together with the time of arrival and the time of departure. The Packard company does not conduct a public garage and therefore this system covers comparatively few cars per hour. Moreover, the case of cars coming in once and then not for another month or so, makes it impossible to use a system other than a sheet on which the cars are entered by hand.

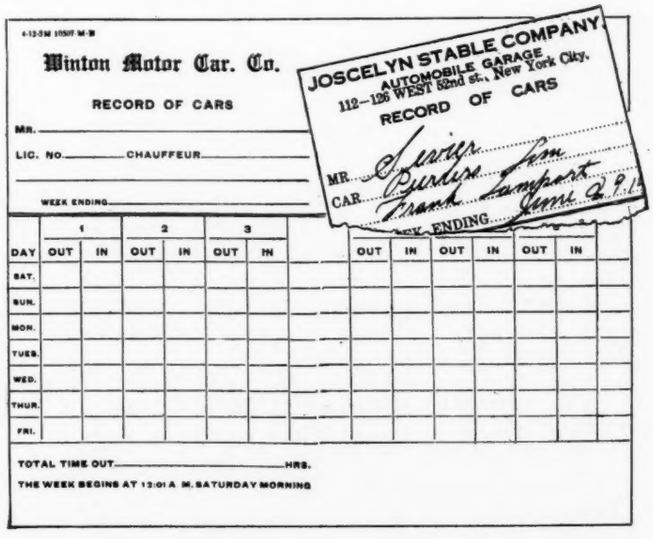
Packard Has Time-Clock System

For its own cars, demonstrating machines and those owned by members of its organization, the Packard company uses a time-clock recording system, in which the International type of recorder is used, together with recording cards of the ordinary design. As Form 3 shows, this type of clock card differs very little from the sort used in keeping time of shop workers. The design is practically the same, only the six columns are named differently and allowance is made for the names of car owner and driver on the card, as well as for the number of the car. Another difference between this card and the shop time card is that the design here shown is twice as wide, but folds to the ordinary size, so that it may be kept on the common type of card rack. The double card, however, gives an opportunity for making twelve records on it, six each for entering and leaving the garage. The cards are kept on the rack in the alphabetical order of the respective owners' names.

Form 3 is used by the Winton Motor Carriage Company, Broadway and Seventieth street, New York City, and is made in duplicate, one copy being on a tan pasteboard card and the other on thin white paper, which is sent to the car owner at the end of the month. If the owner also keeps track of the times when he uses his car, it is easy enough to see whether his driver takes the car out without his knowledge. The Joscelyn garage uses another type of clock card, which differs but slightly from Form 2 and is shown as Form 4.

The latter company handles 300 automobiles daily in the busy season and the cars pass by the recorder at a rate of one a minute. To insure the recording of every car and give the recorder a wide range of vision, he is located in a balcony about 15 feet above the ground, whence he can see part of the interior of the garage as well as the door which is opposite his post.

Opinions on the value of checking systems for cars are naturally divided, and, while the advantage of having a record is not to be underestimated in certain cases, there are also arguments being raised against conducting a recording system. One of the greatest advantages became obvious in the case of a New York automobilist several months ago. His car was said to have been seen at a certain time and place and to have figured in a collision. The records, however, showed that the car was in the garage at the time and the owner of the car thus had an excellent alibi. On the other hand, some garage men hold that most recording boys or clerks are other than absolutely reliable and therefore subject to being bribed by chauffeurs who want to go out on a joy-ride without having any record made of their departure. One garage man put the situation in this drastic way: "If your chauffeur goes joy-riding, fire him and get one who does not." He was very positive in contesting the value of a system in which the personal equation left any opportunity for error and fraud and stated that few owners demand that the garage keep tab on their chauffeurs. There is little opportunity for such abuses, however, if records are made with a carbon copy which is mailed to the owner.



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Winton Motor Car. Co.

RECORD OF CARS

MR.

LIC. NO. CHAUFFEUR

WEEK ENDING

DAY	1 OUT	1 IN	2 OUT	2 IN	3 OUT	3 IN
SAT.						
SUN.						
MON.						
TUES.						
WED.						
THUR.						
FRI.						

TOTAL TIME OUT HRS.

THE WEEK BEGINS AT 12:01 A. M. SATURDAY MORNING

JOSCELYN STABLE COMPANY
AUTOMOBILE GARAGE
112–126 WEST 52nd st., New York City.
RECORD OF CARS
MR. Turner Jim
CAR Burdick Lamport
Frank June 2 9 1

Form 3—Winton's time-clock card, which is made in duplicate
Form 4— Joscelyn Garage uses similar clock card

Cure for Troublesome Gearset; Dimensions of the Jay Eye See; Splash System Criticized; In Favor of Metric System; Believes Radiator Useless; Care of Inner Tubes; Tire Chain As a Mud Hook

Has Trouble with Gear Shift

EDITOR THE AUTOMOBILE:—I have noticed the discussion in the issues of THE AUTOMOBILE for August 1 and 8 on gear shifting and would like to state my case.

The machine is a 1912 Maxwell Special and shifting from low gear to intermediate makes a grinding noise. The heavier the car is loaded the louder the noise. From intermediate to high it is all right. After shifting gear, on any speed, the clutch makes a rumbling noise along with jerking of the machine.

This machine has metal multiple-disk clutch and progressive type transmission.

I have taken all the grease out of the gearbox, but can find nothing wrong except that the end of the square shaft that carries the sliding gears toward the clutch has about 1-8 inch play. Should the bronze bushing that it runs in be loose in this bearing? I also notice that the countershaft runs at the same speed when shifting from low gear to intermediate as when the gears are engaged. It also runs at a high speed when the gears are standing in neutral position. This shaft will stop running only if the clutch pedal is pressed clear down to the floor board, but this cannot be done when the car is in motion as the brakes, being connected with the same pedal, will stop the car.

The clutch has been washed out with gasoline and new oil put in the clutch box. Any information you can give will be greatly appreciated.

New Albany, Ind. F. KAHLER.

—You are evidently troubled more by a dragging clutch than anything else, although there might be a small amount of trouble in the clearance you mention. You have probably noticed that you are compelled to move the clutch pedal through considerable distance before the clutch begins to disengage. This should not be the case, for, in this car, the brake is interconnected with the clutch and should you be compelled to press down too far the forward progress of the car is checked on account of the application of the brakes. The clutch should be adjusted so that the pedal will act more quickly in disengaging it. The linkage of the clutch is shown in Fig. 7, as is the point for making the desired adjustment, the latter being marked A. The length of this lever can be changed to bring the pedal to the desired position.

The play which you mention in the bronze bushing should not prove serious other than having a tendency to make the car noisy on low gear. It would be well to give the clutch another thorough cleaning with kerosene or gasoline in order to be sure that it will be in its best condition.

Jay Eye See Dimensions Given

Editor THE AUTOMOBILE:—Will you please tell me the bore and stroke of the Jay Eye See car? Has it a six or a four-cylinder engine?

Alton, N. H. H. B. TIBBETTS.

—The Jay Eye See car is a four-cylinder Fiat machine. The motor has a bore of 9 1-3 inches and a stroke of 8 5-8 inches.

Does Not Like Splash System

Editor THE AUTOMOBILE:—I have been very much interested in the discussions that are being carried on through the pages of THE AUROMOBILE and believe that there is room for one very valuable one along the lines of whether or not the splash system of lubrication has really justified itself. I am a firm believer in the force-feed system, because it puts the oil in the spot where it is needed, and, what is more, puts the very quantity that experience shows is required into each particular bearing. I believe that when the motor speeds up to a considerable extent the splash system does not adequately take care of the lubrication, unless there is some auxiliary means of adding to the supply in the crankcase by the use of a small hand pump or some other such device. Besides the drawback at high speeds, it has another at low. That is when the car starts off there will generally be a large cloud of blue smoke emitted which alone shows that much unnecessary oil is being burned. When the motor is running idle at the curb with a splash system of lubrication it does not take the spark-plugs very long before they become choked to such an extent that the motor dies. I am at a loss to know what the defense of the splash system can really be when it would not be very much more expensive to install a good non-splash system.

Newark, N. J. LOUIS BOURGEOTTE.

Likes the Metric System

Editor THE AUTOMOBILE:—I have read with much interest the first part of your article on Metric or English Measurements, and wish to be allowed to make a few remarks on just one point.

You say that "workmen are all educated to the foot, inch and yard system and it would take considerable time to get them accustomed to any other method of determining the size of any piece."

I take exception to that statement, as my experience is to the contrary.

When we established our American factory a year ago we decided to keep the metric system so that our parts could be interchangeable with the parts made by our European factories. I wish to say that we have never found one workman who had any trouble on account of figuring in millimeters. Our operators throughout use metric scales and metric micrometers, and I wish to say that the use of this latter is somewhat easier than that of the English one, as the pitch of the micrometer screw is exactly ½ millimeter, whereas the pitch of the English micrometer is 1/40 inch.

I agree with you that changing from one system to the other would be rather expensive, as it would involve a change in the machinery and a change in the measuring devices.

The automobile industry in France, with which I am familiar, uses a great deal of American machinery, which is proof that the builders are able to supply machinery built for the user of the metric system. In fact, I have catalogues of American tool makers which offer the choice of either English or metric ad-

justments, according to the desires (and wishes) of the purchaser of the machinery.

I believe that the changes made would affect only such parts as lead screws or nuts in lathes or milling machines, and, of course, in some cases, changing these parts would involve considerable expense and delay.

Changing of measuring devices would, in most shops, be still more expensive, but, once this change is made, would not the saving in time in the drafting room alone pay for it in a very short time?

Detroit, Mich. G. R. HEFFLY, Zenith Carburetor Company.

Considers Radiator Useless

Editor THE AUTOMOBILE:—For one interested in the internal combustion motor the unraveling of its mysteries is an absorbing study. The individual views and ideas are so varied concerning it that the beginner in search of information thinks that a book telling all that is known and unknown about it would be a big volume, especially the unknown part. Speaking of two-cycle or four-cycle it seems to me that the four-cycle can be so improved as to enable it to easily surpass the two-cycle. A lively discussion in a journal is an interesting and useful source of information, and Mr. Tismer, in his Communication, states he is looking for a fight and moves to abolish the radiator. As to that, I can heartily second the motion, for, to me, the almost general use of this device is no positive proof of its necessity; but his statement, "one but has to look over the efforts to improve engines by more perfect scavenging and the failure of those efforts to look askance at an attempt towards improvement in that direction," seems to lack the pioneer-like traits of character that he deplores in "present practice." This has induced me to send in a description of not only an air cooling arrangement, but also a scavenging arrangement that is, I believe, about as nearly perfect as anything that can be secured. I invite free criticism. Referring to the sketch, Fig. 1 represents the completion of the explosion stroke. As the crank reaches the outer, or lower, dead center the slide valve begins to open and is wide open by the time the piston begins its return stroke. The burnt gases, if under any pressure, go out under their own volition and are further expelled by the returning stroke of the piston until it has almost reached the port, when the cam on the half-time shaft begins to open the poppet exhaust valve at the top of the cylinder. The piston, passing the slide valve port, continues the expulsion of dead gases from the upper end of the cylinder through this poppet valve unto the end of its stroke. Meanwhile, the shaft, operating the slide valve, running at crankshaft speed, but about 90 degrees late, has closed the outer end of the port, this port being situated about the middle of the piston stroke. The piston then begins its return or suction stroke. The poppet valve, remaining open, draws in the cool air from the atmosphere (the burned gases being sent out with such force as to be beyond the recovery of intake) until it reaches about half its downward stroke, the cam having then moved far enough to allow the spring to close the poppet valve. The suction opens the inlet valve from the carbureter, admitting the explosive mixture until the end of the suction stroke, when the inlet valve closes, the crank again passing the lower dead center. The slide valve again opens and the piston on its return stroke drives out through the slide valve port the air that has come through the upper end of the cylinder, cooling it and driving downward ahead of it the remaining foul gases that were in the compression space, perfectly scavenging it. Both the air and remnant foul gases are driven out. The piston passing the port, the mixture is compressed in the upper end, the spark made and the cycle repeated. If efficiency means the utilization of all the heat units in available power, can an engine that expands only to the point it compressed from be efficient? In Fig. 6 a charge of 4 inches is compressed, while in Fig. 1 it is represented in an explosive stroke of 8 inches. Note the simplicity of accomplishment; no transfer ports, nor passages, all inside the working cylinder, on one side of the piston and with no loss of time. The advantage is that, while using the same quantity of fuel as other engines, we get twice their crank leverage. The further expansion utilizing the heat in power development instead of wasting it in a muffler with its back pressure losses, doubling the time for the complete combustion of the fuel. Is not this absorption by expansion in longer power stroke utilizing the heat that is otherwise thrown away through the radiator greater efficiency through this same effort of better scavenging? Further, consider low speed efficiency, the loss by throttling. In this design, for a less power stroke, having no throttle valve, the lower end of the push-rod is moved in toward the cylinder, the angular end of the rod coming in contact with the nose of the cam delays the closing of the poppet

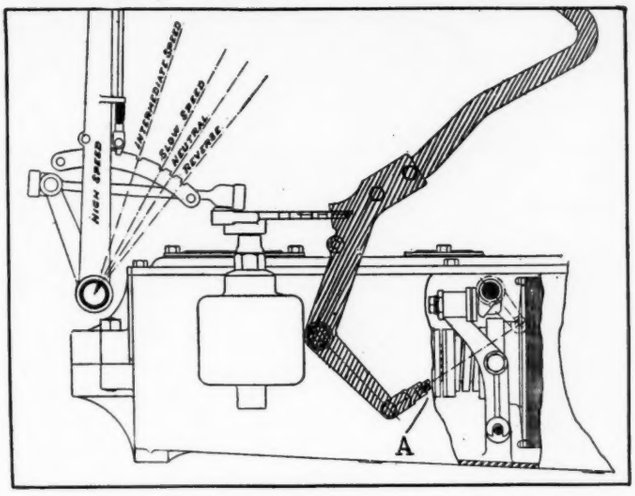


Fig. 7—Showing the arrangement of the clutch on the Maxwell Special

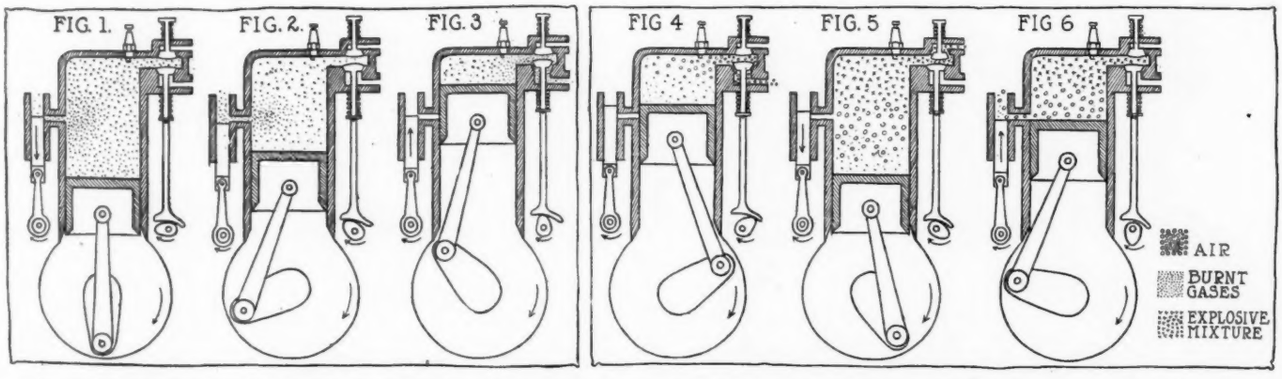


Fig. 1—End of explosion stroke. Fig. 2—Beginning of the scavenging stroke. Fig. 3—End of the scavenging stroke. Fig. 4—Start of suction stroke, only air admitted. Fig. 5—Inlet of explosive mixture. Fig. 6—End of stroke with cylinder scavenged

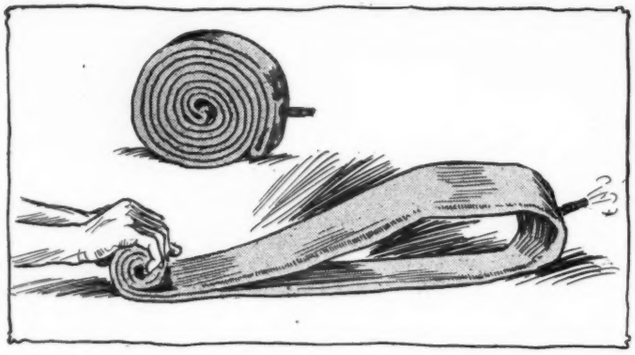


Fig. 8—Proper way to roll an inner tube to make it lie flat

valve, which delays the opening of the inlet valve admitting less explosive mixture, air taking its place. The compression pressure is always constant. The charge is ignited always under the same pressure, less fuel to be burned, less heat units liberated, less power but proportionally as the air acts as an absorber of the heat giving it out as power by expansion, giving a very economical and flexible effect. A six-cylinder engine of this design would take a car as far on a gallon of gasoline as any single-cylinder, not excepting the Only car which, it is claimed, went 40 miles on a gallon. As the perfect scavenging prevents carbon deposit, with a suitable carbureter this design will burn kerosene week in and week out. A gallon of kerosene being equal to about 1 1-2 gallons of gasoline, the kerosene having a little gasoline in it to facilitate starting. I will state that a carbureter, to burn kerosene, can be so small that, with the exception of the air valve, it can be put in one's vest pocket (my engine being 3 by 8). Kerosene can be bought wholesale for 7 or 8 cents per gallon, while the average man who buys his gasoline in small lots pays 22 to 25 cents per gallon. Consider the economy of this engine. What would be the increased efficiency to the average man's pocketbook? Now I would like to know the superior advantages of Mr. Tismer's high temperature; would the wearing parts last as long or longer? Would working under a hood on a hot summer day make it more pleasant for a driver? Would it improve the quality of any woodwork that happens to be near it, eh? He says he can "burn any old thing." Now, I thought it was the function of the carbureter to prepare the mixture for burning. Why make the cylinder do its own work and the carbureter's also unless he dispenses with the carbureter. A gun is an internal combustion engine, yet you do not hear of a sportsman heating his gun to make a long shot. A means of proper mixture may produce a great efficiency with very cool cylinder walls. He uses a compression pressure of about 80 pounds. Of what advantage would this be on a four-cylinder car when a very low speed is desired or climbing a steep hill. It would require a large and heavy flywheel, would it not? Is high compression absolutely necessary to rapid ignition and burning? I have burned kerosene when the compression was so low that turning the crank at twenty-five or thirty revolutions per minute there was not enough pressure to move the crank 1 inch from top dead center, owing to a leaky piston. Yet the engine ran as fast as the unbalanced conditions would allow, between 800 and 900 revolutions per minute. The cylinder was cool enough to permit putting a hand on it. Would not a longer power stroke than compression stroke be a better power, for hill-climbing, etc., would not require a high compression.

Bradenville, Pa. JOSEPH MUNDEN.

Take Good Care of Inner Tubes

Editor THE AUTOMOBILE:—I am driving a Hupmobile runabout and using 30 by 3-inch tires. Of late I seem to have run into a streak of bad luck, as every time I go out I am forced to make at least one tire change. In a short run the other evening down to Seaford, L. I., I had a puncture and am still at loss how to explain it except that there was a deep cut in the casing that possibly allowed a sharp stone to enter and cut the tube. I replaced that tube and was soon on my way. After going some distance we were compelled to stop, owing to the fact that the bars on a railroad crossing were down. After we had stopped I could hear the hissing sound of escaping air and soon saw that the same tire was again troubling me. I took out the tube which I had just put in and saw that there was a small cut in that also. I thoroughly examined the casing, but could find no nail or other sharp object. Is it possible that a cut in the casing would allow a sharp stone to penetrate and cut the tube?

2—I find also that very often the inner tube is stuck to the shoe when I remove the tire. What is it that causes this? It sticks so fast that at times I am afraid to pull it off for fear of tearing the tube. What can be done to prevent it from sticking?

3—One more tire point I should like to know is the best way to carry inner tubes. I use the clincher type of tire and when I make changes it takes me about 20 minutes from the time I first notice the puncture before I get started again. Anything that can shorten this time would be very welcome to me as I detest the work of dealing with articles that possess the usual obstinacy of the inanimate when a man is in a hurry.

Freeport, L. I., N. Y. OWNER.

—It is very possible and often happens that stones cut inner tubes by penetrating an opening formed by a cut in the shoe. The cure is to go over the cuts in your shoe before every trip and, wherever you find a cut, seal it with one of the plastic compounds which are for sale by all the large tire manufacturers. A more permanent job can be made with a vulcanizer and it would repay the trouble that it gives by increasing to a remarkable extent the tire mileage which you will be able to secure.

2—The inner tube will not stick to the shoe if you will powder it thickly with tire talc before putting it into the shoe. When there is no talc, the heat generated by running will be sufficient to vulcanize the tubes and shoe together to a sufficient degree to cause considerable adhesion.

3—You will have no difficulty in carrying the inner tubes flat, as they should be kept, if you are careful to exhaust all the air that is in them. To get all the air out, first remove the entire valve by turning the cap upside-down and using it for a screw-driver, as shown in Fig. 8. This will take the entire valve out and allow the air to escape readily. Pick the tube up and allow the part with the valve to hang down so that it will be possible to start rolling from the other extremity, Fig. 7. By the time the tire is rolled up all the air will be out and the tube

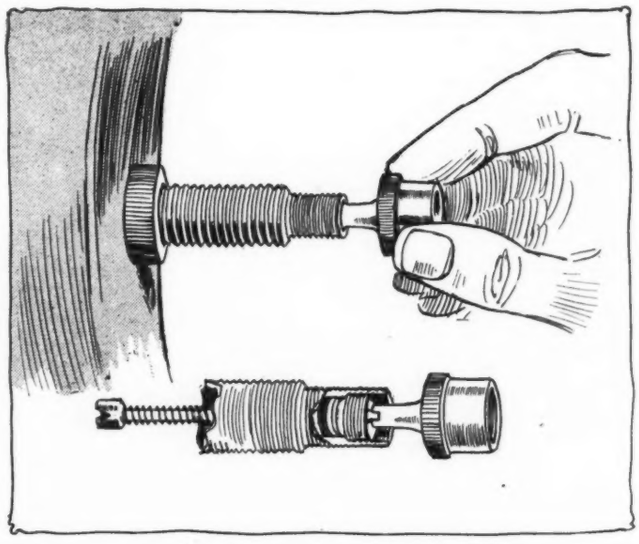


Fig. 9—How to remove the valve to allow all the air to escape

TABLE SHOWING THE RECOMMENDED TIRE DIMENSIONS AND PRESSURES FOR ANY GIVEN WEIGHT AS COMPILED BY SOME OF THE LEADING MANUFACTURERS

MICHELIN

Tire size	Maximum axle load	Pounds inflation
3 inch	600-1000 pounds	50-60
3½ inch	800-1600 "	50-70
4 inch	1300-2200 "	60-75
4½ inch	1400-2600 "	60-80
5 inch	2200-3200 "	70-80

UNITED STATES

Tire size	Weight per front wheel	Weight per rear wheel	Tire size	Weight per front wheel	Weight per rear wheel
28x2½	275	225	36x4	900	750
28x3	425	350	40x4	1000	850
30x3	450	375	42x4	1050	900
32x3	450	375	32x4½	950	750
28x3½	500	425	34x4½	1125	900
30x3½	550	450	35x4½	1175	935
31x3½	575	475	36x4½	1225	975
32x3½	600	500	37x4½	1260	1010
33x3½	625	525	38x4½	1300	1050
34x3½	650	550	42x4½	1450	1200
36x3½	700	600	34x5	1200	950
30x4	750	625	35x5	1250	1000
31x4	775	635	36x5	1300	1050
32x4	800	650	37x5	1350	1100
33x4	850	675	39x5	1450	1201
34x4	875	700	43x5	1550	1400
35x4	885	735	37x5½	1400	1150
			38x5½	1450	1200

Inflation 20 pounds for each inch of tire diameter, i.e., 3-inch diameter tires have 60 pounds; 4½-inch, 90 pounds, etc.

GOODRICH

Tire size	Weight per front wheel	Weight per rear wheel	Inflation pounds	Tire size	Weight per front wheel	Weight per rear wheel	Inflation pounds
28x2½	275	225	55	38x4	950	800	75
30x2½	275	225	55	40x4	1000	850	75
28x3	425	350	65	42x4	1050	900	75
30x3	450	375	65	32x4½	950	750	80
32x3	450	375	65	34x4½	1125	900	80
34x3	475	400	65	36x4½	1225	975	80
28x3½	500	425	70	38x4½	1300	1050	80
30x3½	550	450	70	40x4½	1375	1125	80
32x3½	600	500	70	42x4½	1450	1200	80
34x3½	650	550	70	35x5	1250	1000	85
36x3½	700	600	70	37x5	1350	1100	85
30x4	750	625	75	39x5	1450	1200	85
32x4	800	650	75	41x5	1500	1300	85
34x4	875	700	75	38x5½	1450	1200	90
36x4	900	750	75	40x5½	1600	1350	90

FIRESTONE

Tire size	Weight per wheel	Inflation	Tire size	Weight per wheel	Inflation
28 to 36x3	350	50	34x4	700	75
30x3½	450	60	36x4	750	75
32x3½	550	60	32x4½	700	85
34 and 36x3½	600	60	34x4½	900	85
30x4	550	75	36x4½	1000	85
32x4	650	75	36x5	1000	90

will be found in such a condition that it will be comparatively easy to put it in a very small box. When the tube is in the box it should be thickly dusted over with the tire talc, as this serves to keep the rubber from becoming sticky, especially in hot weather, when the folds are likely to adhere to each other.

Never carry envelopes or shoes uncovered so that they are exposed to light, to temperature variations and to oils and grease. Very strong light, such as sunlight, has a tendency to make tires brittle so that they will crack in places. This at the same time takes away their elasticity. Tires, when stored by the man who knows, are placed in dark rooms where the temperature is kept as nearly constant at 50 degrees as possible, for temperature variations age them prematurely.

Interested in Over-Tiring

Editor THE AUTOMOBILE:—I have a 1911 Cadillac which has rims that take 34 by 4-inch tires. Would it be advisable to use larger shoes than these? If so, what size could be procured that would fit these same rims? The rims are of the Q. D. type. Would larger shoes affect the running of the car in any way? A discussion on this topic would greatly interest me and I should imagine many other car owners would find it of great value.

New York City. F. D. MARTIN.

—Regardless of the make of your car it has been proven before now that it is most economical in the end to slightly overtire your car. The size of the tire is determined by the weight it has to carry and the experts in the employ of the different tire companies have figured out very closely just what tires should be used with a given weight. The car should be first carefully weighed when fully loaded for touring. That is, the passengers should be placed along with all the baggage that would be carried on a tour. If it is not feasible to get the weight of the car in that condition, it should be loaded up to the extent that it would be on a long tour and the weight on each axle taken in that condition.

The weight on each axle should be taken separately, as the loads will be different in front and rear. By running the car up on the scales which will be found at any railroad station the whole weight may be found as well as the weight on the rear axle. When weighing one axle at a time it would be well to get the car level by means of a spirit level before the weight is taken. If this is not done there will be a slight inaccuracy. The tires that the car makers recommend for each weight can be seen by the accompanying table, which expresses the ideas of the leading tire men. Should it be desired to over-tire the car, the next largest size tire having the same diameter is used.

As far as affecting the running of the car goes there will hardly be a noticeable difference when a slightly larger tire is used. If there is any tendency at all it will be toward making the car run easier over slight irregularities in the road. It is safe to state that in every instance where the heavier tire is used the increased first cost will be balanced by the decreased cost of upkeep.

Tire Chain As a Mud Hook

Editor THE AUTOMOBILE:—It often happens that one delays in putting on the tire chains until the rear wheels are actually stuck in the mud. When this occurs, it is often difficult to jack up the wheels, as the soft mud sinks under the weight of the car and the jack. An expedient which will pull the wheel out of almost any mud if the motor has power enough is to wrap the chain about the tire and rim in the manner shown in the sketch, Fig. 9. Fasten the ends of the chain around a spoke. Care should be observed in starting the car or the spokes are likely to be damaged.

Allegheny, Pa. MURRY FAHNESTOCK.

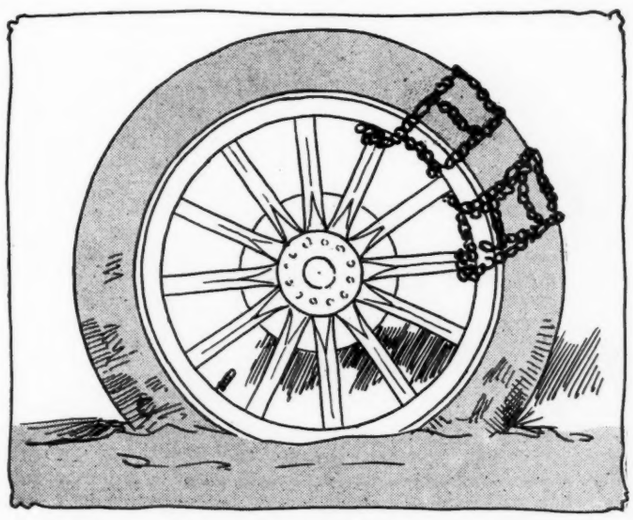


Fig. 10—How tire chain can be applied as a mud hook

Conclusions From the Army Truck Tests

Every Year the Military Authorities of France Draw the Line More Strictly Between the Fit and the Unfit Among Commercial Motor Vehicles—Points Relating to Reliability and Accessibility Sharply Brought Out

GENERAL opinion among all directly concerned in the 30 days' trials of French motor trucks which were conducted under military supervision, from the town of Versailles as a center of operations, and have recently been concluded (see account in THE AUTOMOBILE of August 15), ascribes to these trials and the methods adopted for ascertaining all the essential facts in connection with the performances of the vehicles a much greater importance for the rational development of motor truck design and construction details than could be justly credited to any other tests ever held. The basis for this opinion is to be found in the duration and thoroughness of the trials, the total absence of prizes and awards and the impartiality of the military authorities. Observations have been made and opinions have been expressed in connection with these tests wholly without reference to considerations of commerce or publicity. Some of these observations will be found of value and interest to users, owners and makers of motor trucks anywhere, although local conditions may in some cases impose a different interpretation of the facts from that which is accepted as final, or conclusive for the present, in France.

In a general way the first notable conclusions after the trials had been in progress for some time, under rather severe weather conditions, were to the effect that the forty chain-driven vehicles had demonstrated no advantages by reason of their driving system over the twenty-two shaft-driven vehicles, that wood wheels are still preferable for trucks, that rubber tires are a necessity at all speeds exceeding 12 kilometers per hour, that even the wheels of trailer wagons must be so shod to make these vehicles sufficiently durable, that on the whole the trailer is an unsatisfactory adjunct and that motor brakes are practically indispensable. A large number of more detailed observations are of record. A well-known technical commentator, writing over the name of "Lambda" in *Omnia* of August 10, notes the fact that many constructors, among whom Renault, Saurer, Berliet, De Dion-Bouton, place a positively acting centrifugal governor inside of the crankcase where the driver cannot get at it, so that it becomes mechanically impossible for him to drive the empty truck faster than the loaded one or beyond its predetermined maximum speed. The wheel brakes need to be improved, he says. If the transmission, which begins at the clutch, is out of order or disconnected, one depends absolutely on the wheel brakes to hold the vehicle. They must be capable of doing this on the steepest hill, and he refers to the brakes on Parisian omnibuses as a model for imitation with regard to construction—which includes an oil-tight casing around the brake drum—as well as in regard to the system for keeping them in order. But, he adds, it would also be very desirable to have the motor brake, as used on Saurer or Panhard trucks, generally adopted. It represents the only braking method admissible for vehicles of considerable tonnage in hilly countries with long gradients.

DIAGRAMS OF MOTOR BRAKE ACTION

On this subject of motor brakes Captain Renaud gives additional information in a lengthy technical analysis of the trials appearing in several issues of *La Technique Moderne*. It is summarized graphically in the indicator cards presented as Fig. 1, showing, first, how the motor ordinarily functions, secondly, how it functions when the Panhard motor brake is applied and thirdly, how it functions when the Saurer motor brake is put into action. In the Panhard motor the camshaft for the exhaust valves is mounted so that it can be displaced lengthwise by pressure on a left-foot pedal; and as the clutch remains engaged when the brake is in action the driver's left foot is free for this purpose. The cams are broadened and are formed with two special bosses on that portion which does not engage the exhaust valve stems when the motor is in normal operation. But when the shaft is displaced these bosses produce the action shown in the second diagram, which is as follows:

Suction stroke—Induction of a small amount of air through the admission valve and the carbureter, whose air apertures are closed, resulting in an approximate vacuum in the cylinder.

Compression stroke—Sudden opening of exhaust valve causing an inrush of gas or air but followed by immediate closing of the exhaust valve and compression of the cylinder contents, both valves being now closed.

Third stroke—Sudden opening of the exhaust valve allowing the compressed gases to escape, again followed by immediate closing and the formation of an approximate vacuum by the descent of the piston; normal opening of exhaust valve at end of stroke.

Fourth stroke—Exhaust valve open and resistance none, excepting the piston friction.

THE POWER OF THE BRAKES

This method results in a negative work of the motor equal in volume to 65 per cent. of the work which the motor can develop for traction purposes, but, as the losses in efficiency which are normally due to frictions in the transmission mechanism of the vehicle become favorable for holding the car back, the total braking effect is, under the supposition of a transmission efficiency of 70 per cent. equal to 92 per cent. of the normal motor work. In other words, with this motor brake it is possible to hold a vehicle back on any hill over which the motor could pull it up by using the same gear speed for the braking that would be used for traction.

The means used in the Saurer motor are even more powerful. The camshafts are not modified and are not displaced longitudinally, but a worm gear control mounted upon a shaft placed in the axis of the steering post enables the driver to change the timing of the exhaust camshaft and at the same time acts upon the carbureter so that nothing but fresh air is admitted to the induction manifold. The admission valves are opened and closed as usual and the exhaust valves are opened at the end of the second (the compression) stroke and closed at the beginning of the fourth (the evacuation) stroke. The motor is thus transformed into a two-cycle air compressor with the following strokes:

First stroke—Induction of air at the admission valve.

Second stroke—Compression of air; all valves closed.

Third stroke—Opening of exhaust valve, escape of compressed air and induction of fresh air through the exhaust valve which remains open.

Fourth stroke—Compression of this air, all valves being closed.

First stroke—Opening of admission valve, escape of the compressed air followed by the induction of new air through the open induction valve, etc.

The total braking work reaches about 95 per cent. of the traction work of which the motor is capable and, counting with the resistance in the transmission mechanism as in the case of the Panhard system, this rises to about 130 per cent. of the normal traction work of the motor.

[There seems to be an error in the author's supposition that the work performed by the gravitation of the vehicle on the hillside can reach the percentages mentioned, since the air pressures reached under braking action under no circumstances approach those produced by the explosions in normal motor operation, and a comparison of the areas of the three diagrams seems to confirm this doubt. As, however, the motor brake is not intended to hold a vehicle on a hill or to drive it backward uphill but to permit it to descend at a moderate speed, the high percentages mentioned should not be required.—ED.]

One of the military commissioners acting as judges has given separate expressions in *Omnia* of August 10 to some of the intimate observations which the close supervision of the long-continued and arduous work of the trucks permitted him to make. His most important remarks relating to the lessons of the tests are summarized in the following.

COMMENT BY ONE OF THE JUDGES

Most of the motors are capable of giving continued service without accidents or excessive wear, but few of them operate without injury to the chassis. A motor can evidently not be transferred successfully from a pleasure car chassis to a truck. Vibrations which are harmless or even unnoticed on a light chassis become very powerful on a truck frame. No very clear explanation has yet been given of this fact, although it may be that the touring car chassis is too flexible to furnish the reactions by which the vibrations grow in intensity. At all events I have seen an unexceptionable touring car motor communicate to all such pieces of a truck as rivets in mudguards and spindles of clockwork a wild rotation around their axes resulting in extremely rapid wear. It follows from this fact that the truck motor should be one of slow rotation. Perhaps the six-cylinder type would give good results, but the army regulations exclude it. The most experienced motor truck builders have this year equipped their vehicles with large slow-speed motors regulated by a governor. An ingenious expedient adopted by one of them consists in placing the governor under the influence of the speed lever, so that the motor is limited to 800 revolutions on the high speed, but can speed up to 1,000 revolutions on the reduction gears. This renders it practicable to maintain a very uniform vehicle speed in spite of gradients.

Magnetos and carbureters left nothing to be desired. Though the motors were left hot under the open sky every evening and were covered with dew in the morning, it was very rarely that they could not be started with a single turn of the crank, whether alcohol, gasoline or benzol was the fuel used. The commissioners are for that matter insisting that the magnetos and tires of all subsidized vehicles shall be made interchangeable even if of different manufactures, and the tendency among the truck builders to buy standard carbureters, rather than making their own, supports this standardization of the principal organs. In the case of radiators the same trend seems to be working toward the Solex type with centrifugal fan.

STRENGTH AND DIMENSIONS OF PARTS

Clutches on trucks should be more powerful than on a light vehicle with the same motor power. It is evident, for example, that at the start with a heavy load the clutch must be slipped longer and consequently must be capable of absorbing more work without overheating. The cone type has proved harsh in engagement and the multiple-disk clutch too slow in the release. The Dion-Bouton metallic plate clutch was the only one giving full satisfaction with heavy loads.

The majority of the gear boxes had four speeds, but these were often poorly assorted. The third speed was too near to the fourth and was very seldom used. In practice, when the motor was of sufficient power, three speeds gave as much satisfaction as four. The gears should be much stronger than on pleasure cars of the same power, because a harsh start or acceleration of a light car is relieved by yield and slip of tires but catches the gears of a truck as between hammer and anvil.

A MISSING CONSTRUCTION FEATURE

It is astonishing that no vehicles were presented at the trials in which the gear box was provided with a free shaft adapted to be thrown in mesh to actuate a pump, a crane or any other mechanical tool. In places where the truck must now await its turn among horse-driven trucks, having no better facilities than these for quick loading and unloading, and where the shortness of the haul prevents it from making up for waiting-time by its greater speed on the road, such an arrangement might turn a doubtful economical balance in its favor.

Even in the cases where iron-tired rear wheels gave satisfaction and endured the speeds demanded—and only two such cases went on record, in both of which the rear wheels were not drivers—little accidents occurred, such as fracture of brake rods and loosening of bolts, which could only be ascribed to vibrations originating in the iron tires. In one instance solid rubber tires bursted like pneumatics, and the cause seemed to be a weak axle which alternately bent and straightened under the influence of the road shocks and made the tires scrape to and fro transversely, finally splitting them.

If the program of the trials had included descents of several kilometers in length it is doubtful if the brakes, which were uniformly quite efficient for stopping the vehicles, would have proved acceptable as speed reducers. Hardly any size of mechanical brake would be sufficient for transforming the continued gravitation of heavy loads into heat without trouble. The motor brake, on the other hand, does not accumulate heat units, as it throws them out with every release of its air charge.

Spring suspensions are not yet what they should be. The chassis suffer greatly from the fast runs without load which are demanded of them. Results showed that the load should be between the springs rather than above them, confirming the experience established for touring cars. The shackles should be long and their joints carefully machined and lubricated.

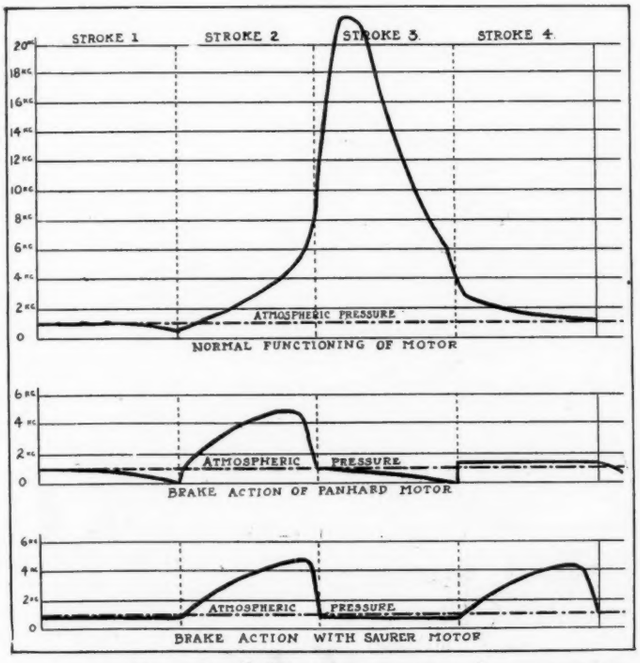


Fig. 1—How motor brakes transform the piston pressures

PATENT DEVELOPMENTS FROM ACROSS THE ATLANTIC

ALTHOUGH the attention of the automobile public in general has been centered on the patents issued in this country for some time, inventors in the lands over the seas have not been idle. In fact, they have been very busy emulating the ingenious Yankee and have conceived some ideas and produced some devices which bid fair to achieve worthy places in the automobile industry. Realizing the importance of these developments, THE AUTOMOBILE has prepared the following brief review of the most important patents issued by the British Patent Office during the month of July.

Valve Gear of Argyll Class—By means of which a sleeve valve is simultaneously reciprocated and oscillated.

The mechanism, Fig. 1, actuates a sleeve valve around or inside a cylinder by two cranks C1 and C2, which are driven from the half-time gear shaft. Reciprocating motion is imparted to the sleeve by the crank throw R and the link L which is connected to a pin P; the latter is carried in lugs on a collar C3 which bears on the flanges F at the lower end of the sleeve. The crank C2 has a spherical crankpin P1, from which a link L1 and connecting mechanism consisting of a universal joint—which is shown by shading—transmits the oscillatory motion.

No. 7,942 British—to J. S. Matthew and Argylls, Ltd., Alexandria, Dumbartonshire, England.

Double Horizontal Sleeve Valve Motor—In which two telescoping sleeves are provided for every pair of cylinders.

The sleeve valve mechanism for a four-cycle, four-cylinder engine shown in Fig. 2, comprises a pair of telescoping sleeves S and T serving one pair of cylinders C1 and C4, and another pair of sleeve valves U and V having the same relation to cylinders C2 and C3. Tightness between the valves and the guides in which they work is obtained by piston rings R surrounding the outer sleeves S and U. The inner sleeves T and V are hollow and the exhaust may pass through them to the exhaust pipe E. The inlet manifold is connected by leads P and P1 to the two pairs of sleeve valves, and the passage of gases into and out of the cylinders is governed by the registering of ports in the sleeves and the cylinders. The movement of the valves is controlled by a single half-time eccentric H carrying two blocks which work in slotted arms, whereby a stirrup S1 is reciprocated. This in turn oscillates a lever M. The sleeves S and T are connected to the stirrup S1 and the sleeves U and V to the arms of the lever M.

No. 8,510 British—to G. J. de Jong, Antwerp, Belgium.

Differential Gearset—Which is combined with the gears of a transmission set.

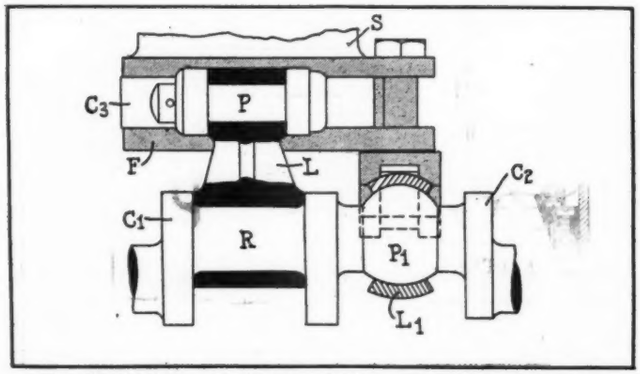


Fig. 1—Matthew and Argyll rotating and reciprocating valve

In this invention, Fig. 3, the driving shaft carries two bevel pinions A and B; these, and another pair A1 and B1 which are freely mounted mesh at diametrically opposite sides of annular bevel gears D, C and D1; any one of these gears may be clutched to the casing E of the differential and the entire mechanism is removable by withdrawing it in the direction of the drive shaft. Gears C, D and D1 and the casing E are mounted in ball bearings carried by the housing H and may be removed after taking the cover C1 off the large casing, whereby the whole differential mechanism is lifted out. The gears D, C and D1 have internal clutch recesses receiving projections of clutch disks which slide in the casing E.

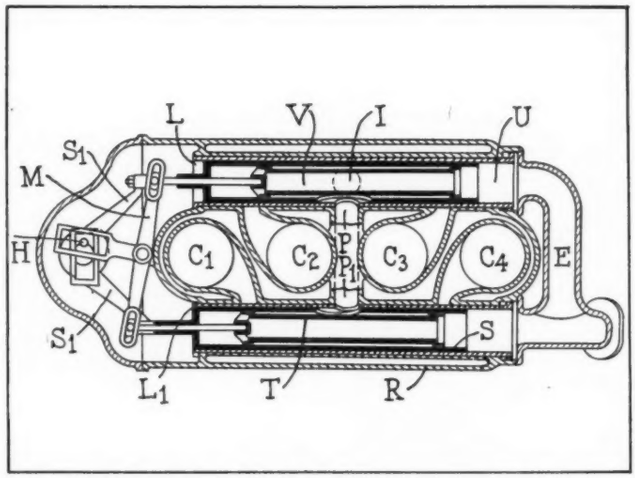


Fig. 2—De Jong double reciprocating sleeve valve motor

No. 7,608 British—to W. T. Martersteck, Sharon, Pa.

Combustion Engine Carbureter—In which the passage of air is controlled by a sleeve valve sliding in the mixing chamber.

The carbureter, Fig. 4, described in this patent has a straight passage extending through it, in which are located valves adapted to move transversely. These valves are arranged telescopically and are independently actuated. The mixture is controlled by a valve V which is cut away on one side and which contains a plug valve P. The lower end of the latter varies the air passage which surrounds the fuel nozzle N. The lower end of the valve V is cut away so as to fit over the nozzle while the plug leaves a small fuel and air space around the nozzle, even when it bears directly on the same.

No. 6,348 British—to F. H. De Veulle, Birmingham, England.

Fuel Feed—The demand of the engine regulates the supply.

This patent on fuel carburetion relates to the arrangement shown in Fig. 5, in which the pump P supplies a liquid fuel to the engine cylinder C, being controlled by the movement of a fuel reservoir on a counterbalanced lever L which controls the suction valve of the pump. The reservoir moves when the quantity of fuel supplied to it from the pump exceeds or falls short of that passing to the engine. Gaseous pressure is supplied to the reservoir from a gas bottle G.

No. 8,867 British—to C. Kloos, Amsterdam, Holland.

Internal Combustion Motor—In which the piston is so formed as to provide a channel between the combustion chamber and the space in which the combustible mixture is compressed.

In this engine, Fig. 6, the mixture is compressed in an an-

nular chamber which is formed at the front of the cylinder. The mixture is introduced through a valve V and cylinder ports P and Q. The latter register, at regular intervals, with ports P1 and Q1 in the piston wall, and it will be seen that, when the port P is uncovered by the piston, the charge compressed in the annular chamber is transferred therefrom through the ports Q and Q1 into the combustion chamber.

No. 8,878 British—to C. T. D. Sangster, Bournbrook, near Birmingham, England.

Hydro-Carbon Fuel Carbureter—In which the throttle has the form of a sleeve valve governing the main air inlet.

The principal feature of this carbureter, Fig. 7, is the use of a sleeve valve S which fits into the mixing chamber C of the carbureter. Sleeve S surrounds a throttle valve V which is also shaped as a sleeve valve, and, when moved up or down, covers or uncovers the main air port M of the carbureter. After descending to a certain level the throttle uncovers the auxiliary inlet A. The fuel nozzle which is seen in the lower portion of the carbureter is surrounded by primary air ports Q which are

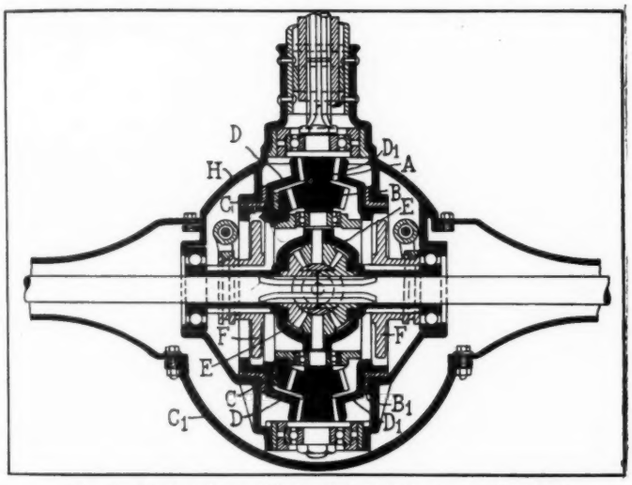


Fig. 3—Martersteck differential gearset for automobiles

controlled by a valve W loaded by a spring S1 and actuated by the same handle bar which operates the throttle valve V.

No. 9,235 British—to J. A. Mackay, Harrogate, England.

Automobile Engine Carbureter—In which the air enters through tapered channels and is given a whirling movement.

In this carbureter, Fig. 8, the liquid fuel is supplied through a number of nozzles O in a transverse bar T, which is located between two tapered air channels C1 and C2 through which the air is supplied to the mixing chamber. The rotary valve V

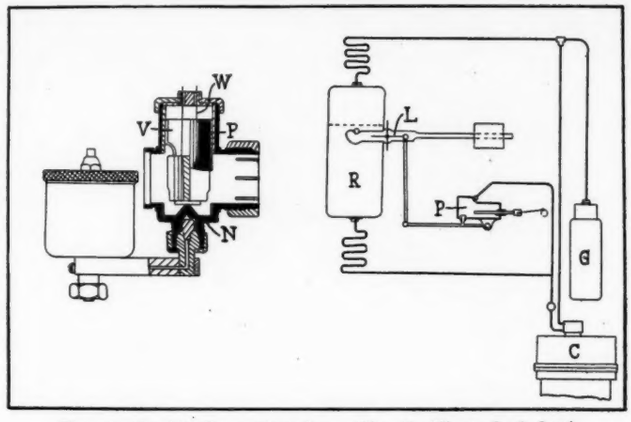


Fig. 4—De Veulle carbureter. Fig. 5—Kloos fuel feed

governs the extent to which the mixture passage P is opened, and the lower end of the throttle cylinder is provided with a choking plate which imparts a whirling motion to the air entering through the two supply channels. By this arrangement the movement of the throttle controls the ratio of mixture of air and fuel.

No. 9,252 British—to H. R. Barrett, Manchester, England.

Sleeve Valve Automobile Engine—In which two horizontal sleeves are reciprocated above the cylinder head through which the gases enter and leave.

This engine, Fig. 9, is designed to operate on the four stroke cycle. The inlet of the charge and the exhaust of the waste gases are controlled by a pair of tubular telescoping valves V1 and V2, the former of which contains a partition whereby it is divided into two chambers L and E which are in constant communication with the inlet and exhaust manifolds respectively. The valves are reciprocated independently of one another by the action of two cranks C1 and C2 driven at half engine speed and set at 45 degrees to one another. Ports in the valves provide communication between the cylinder combustion chambers and the proper manifolds at predetermined periods of the engine cycle.

No. 6,447 British—to Société des Establissements Lyonnais Rochet-Schneider, Lyons, France.

Spark-Plug—In which the positive electrode and its insulation may be moved up and down inside the shell.

The spark-plug described in this patent is shown in Fig. 10. Its positive terminal P and the insulation I are mounted inside a sleeve S which is slidable in the bushing of the plug and has a conical face adapted to seat on the gland G against which it is held by the pressure of a spring S1. The sleeve moves toward

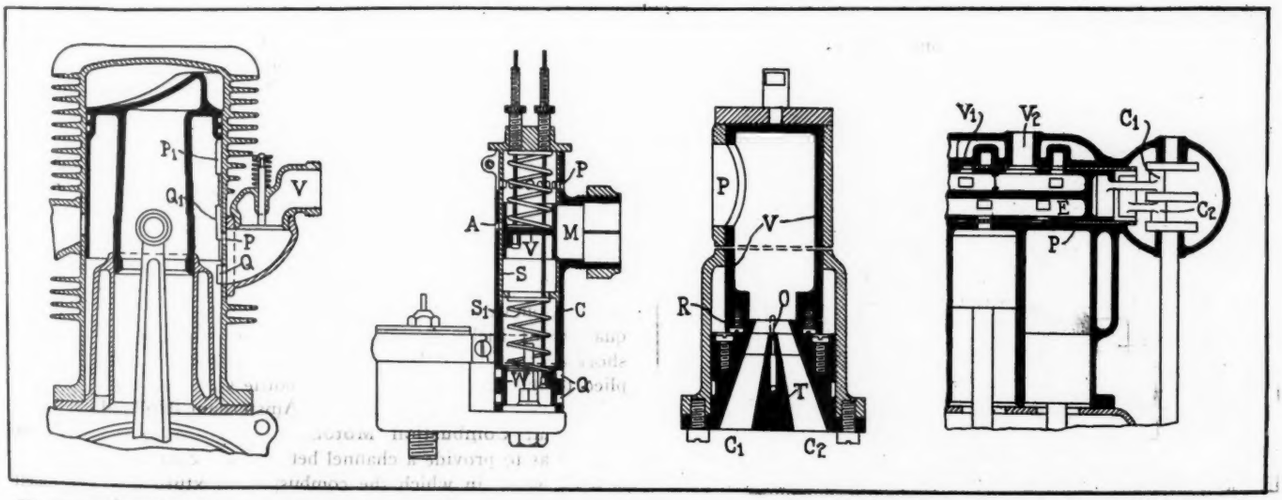


Fig. 6—Sangster internal combustion motor. Fig. 7—Mackay carbureter. Fig. 8—Barrett carbureter. Fig. 9—Rochet-Schneider motor

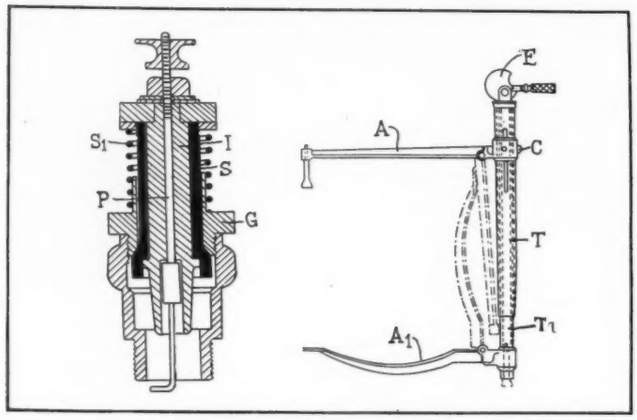


Fig. 10—Wallace-Green plug. Fig. 11—Zehnder valve tool

the interior of the cylinder during the suction stroke of the latter, whereby air is admitted and passes the sparking point of the electrodes. The shell may be provided with a brush or scraper against which rubs the central electrode P which is thereby cleaned of carbon deposits.

No. 77,787 British—to F. H. Wallace and T. Green, Stourbridge, England.

Valve Removing Tool—In which the arms for compressing or extending the valve spring are carried on two telescoping tubes.

The device referred to in this patent is a valve remover, Fig. 11, which is composed of two telescoping tubes T and T1, each one of which carries a folding arm, A and A1. The inner tube T1 has an eccentric or cam lever E at its upper end, by means of which the device is operated. The arm A is hinged to the tube T by an adjustable collar C, and is fitted with a spindle S designed to engage the valve; the arm A1 has a forked end for the purpose of embracing the valve stem.

No. 7,654 British—to J. Zehnder, Granichen, Switzerland.

Steering Gear Adjustment—Obtained by interchangeable parts.

This patent refers to a method of adjusting steering columns to compensate for wear. In Fig. 12, the steering post P is adjustable around the worm spindle H; the worm and worm wheel are inclosed in a casing which is clamped to the frame F by means of a nut G. The portion F1 of the frame may be replaced by a separate member.

No. 6,975 British—to A. Leruitte, Liege, Belgium.

Internal Combustion Motor—In which two pistons work inside of one another forming a separate compression and combustion chamber.

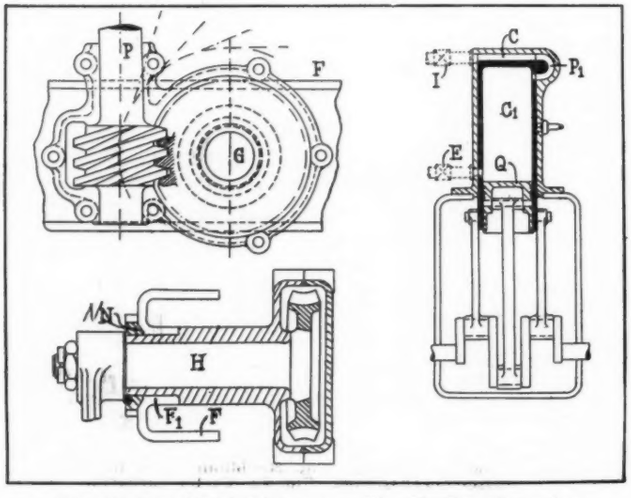


Fig. 12—Leruitte steering gear. Fig. 13—Downie engine

A scavenging engine is the subject matter of this patent. The cross section, Fig. 13, shows how the feature of perfect scavenging is obtained by the use of a double piston composed of an outer piston P and an inner one Q, both of which are actuated directly from different throws of the crank shaft but which have the same stroke. On the suction stroke of the engine the mixture is admitted through the pipe I into the space C, in which it is compressed during the following stroke by the piston P. Toward the end of the compression stroke when the piston P reaches its highest position, the compressed mixture is transferred from the compression space C through the passage P1 into the combustion space C1 where it is ignited, the explosion driving down the piston Q. The exhaust valve E is contained in a pipe just above the position which piston Q assumes after passing through lower dead center.

No. 6,119 British—to W. Downie, Stranraer, England.

Hydraulic Transmission System—In which a sleeve formed as a dog clutch may be shifted to engage a driven shaft or to move another sleeve on the same shaft which actuates a pump mechanism.

The transmission system, Fig. 14, which is the subject matter of this patent, is so constructed that it provides a direct connection between the driving shaft and the driven shaft or that the movement of the driving shaft may be made quicker or slower by means of a system of pumps. The connection between drive shaft and driven shaft is obtained by the engagement of the combined sleeve and dog clutch S with a member M on the driven shaft, while the pumps are actuated in the following way: If the sleeve S is shifted in the direction opposite to the one in which it engages the member M, it is brought into engagement with the sleeve S1 on the drive shaft D. S1 carries the mechanism M1 which actuates the pump or pumps by means of which the gear ratio between the two shafts is regulated.

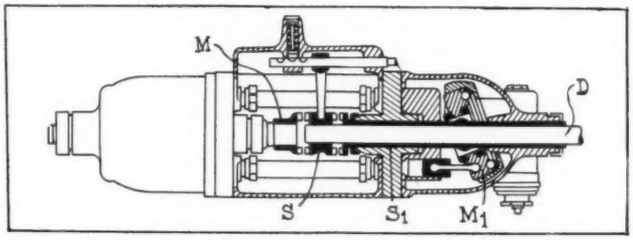


Fig. 14—Delaunay-Belleville hydraulic transmission system

No. 6,525 British—to Soc. Anon. des Automobiles Delaunay-Belleville, Saint Denis, France.

Non-Skid Device for Tires—Consisting of a transverse leather strap which is studded with metal plates.

This patent has reference to a tread band, Fig. 15, providing a non-skid surface for the tire casing. The band consists of a leather strap L which is faced with studded metal plates M bent around it and held to it by means of points P. This leather strap is passed from one side of the tire to the other in zig-zag manner, being fastened at the bead lines by means of hooks H which engage the spokes of the wheel and are made in two threaded parts constructed to permit of adjusting the straps.

No. 7,438 British—to W. Haseloff, Steinau, Germany.

Method of Carrying an Illuminating Number—The license number of the car is visible on the body.

This patent, Fig. 16, refers to the indication of the license number on the back of an automobile body, preferably by painting it on to the same. In order to have the number visible during the hours of the night a lamp which projects a powerful beam of light on the number is positioned below the same and attached by brackets to the chassis or the body of the car.

No. 4,864 British—to B. F. Ruettiger, Bonn, Germany.

Internal Combustion Motor—In which a large charge is admitted to the cylinders.

In this engine, Fig. 18, a single sleeve valve S opens the inlet port P toward the end of the suction stroke of the cylinder.

This feature of the design permits the residual dead gases in the cylinder to cool during the suction stroke and to contract, so that a relatively large fresh charge is drawn in when the inlet port is opened. The advantage thereby derived is still more accentuated by the fact that a late opening of the inlet port increases the vacuum in the cylinder, which also insures a maximum charge of mixture. The exhaust port E is located at the top of the cylinder and is opened at the beginning of the exhaust stroke, while the auxiliary port E1 opens toward the end of the power stroke. The inlet port P is arranged slightly above the lever of the port E1.

No. 5,014 British—to R. Miller, New York City, N. Y.

Carbureter for Automobile Motor—In which the primary air inlet is controlled by a sleeve valve providing also a choke tube for the mixture.

The carbureter, Fig. 22, described in this patent is of the float-feed type and the regulation of the fuel air ratio is obtained through the use of a sliding valve V. The lower part of this valve is shaped as a sleeve which may be moved up or down to vary the cross section of the main air intake A while the upper portion of the valve forms a plug which fits the carbureter housing, part of which is cut away at A1 to provide auxiliary air inlet. The fuel flows from the float chamber to the fuel nozzle N, the opening of which is governed by a needle valve F. The nozzle is held in place by a conical shoulder S and a nut N1, while a drain plug P1 is located at a passage communicating with the interior of the nozzle. At low engine speeds the valve V is held in its lowest position by a spring S1 interposed between it and the top portion of the carbureter housing which spring is compressed when the throttle is opened to speed up

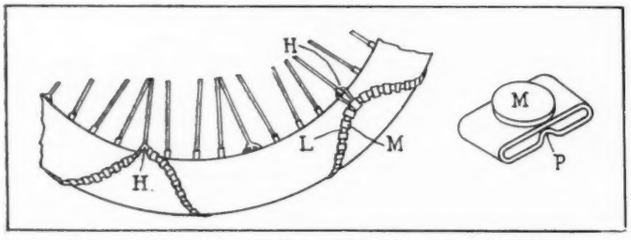


Fig. 15—Haseloff non-skid device for pneumatic tires

the motor. The mixture outlet is by means of an elbow extension arranged at the level of the plug portion of the valve.

No. 5,215 British—to T. Carter, Weaste, Lancashire, England.

Sectional Rubber Tires—The tire blocks are each formed with a bead embracing the wheel rim.

The tire referred to in this patent, Fig. 20, consists of a number of individual rubber blocks or sections which are moulded with bead portions B fitting into the flanges of the wheel rim and with others, B1, bearing on the outside of these flanges. The bases of the tire blocks are covered with a layer of canvas C and are provided at their ends with holes H which are adapted to receive wooden wedges of plugs designed to hold the blocks securely in place. In the center of each block there is a sponge-rubber core R vulcanized in place. The patent also mentions that the rim may be formed with detachable segments removable for installing the blocks on the wheel. This method is used for mounting all blocks except the last one, which is put in place and secured by radial bolts engaging the holes H in the two neighboring blocks.

No. 7,930 British—to F. Milan, Lockwood, England.

Tire Protector and Cover—Being composed of narrow transverse strips of rubber and fabric.

The cover referred to in this patent, Fig. 17, comprises a series of narrow strips T of rubber and fabric, which are arranged transversely over the tire tread and secured to one another by means of metal side rings R which may be formed with scalloped ends so as not to cut the fabric and rubber. Fig. 17 shows cords C inserted in the protector strips; these cords have looped

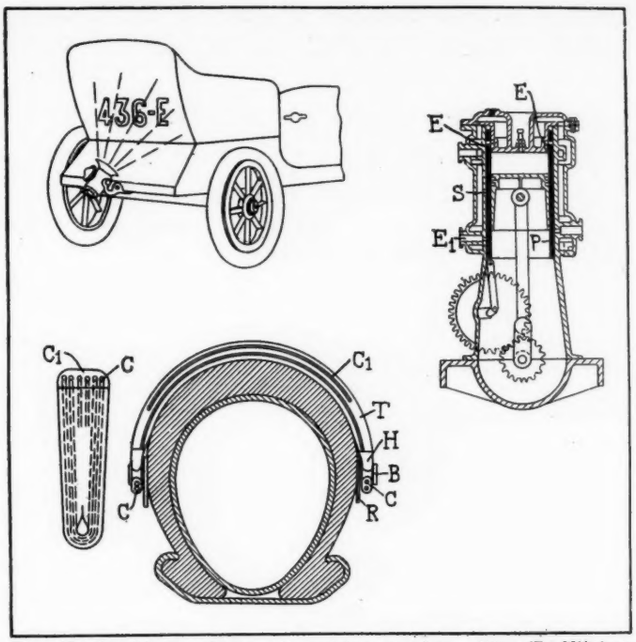


Fig. 16—Ruettiger scheme of carrying number. Fig. 17—Kitchen tire tread. Fig. 18—Miller sleeve valve motor

ends. The strips also have canvas tapes C1 and are secured to the rings R by buttons B engaging holes H in these strips.

No. 7,338 British—to J. G. A. Kitchen, Scotforth, Lancashire, England.

Automobile High-Speed Signal—Wherein an electric circuit is opened when the axle revolves at or above a certain speed.

The signal, Fig. 21, described in this patent is displayed to the driver at any speed below a given number of revolutions of the axle. When the axle reaches this critical speed the shaft R, which may be fixed at varying distance from the axle A and which carries a centrifugal governor controlling an electric circuit, is rotated so fast that the deflection of the governor opens the circuit which it closes at lower speeds. The result is that the signal mentioned above ceases to be displayed to the driver.

No. 8,999 British—to R. Kaiser, Geneva, Switzerland.

Adjustable Spark-Plug—In which a contact between the central electrode and the shell may be made.

This patent described the spark-plug, Fig. 19, in which the terminal may be short-circuited owing to the following method of construction. The insulation I is surrounded by a rotatable sleeve S carrying a metal plate M which is a conductor of electricity. When the sleeve is turned into the position shown in the illustration, the metal plate M contacts with the insulated electrode P by means of a spring-pressed plunger P1. The sleeve is held on the plug by screws S1 in the plug body entering a groove in the sleeve.

No. 7,810 British—to D. W. Player, Folkestone, Kent, England.

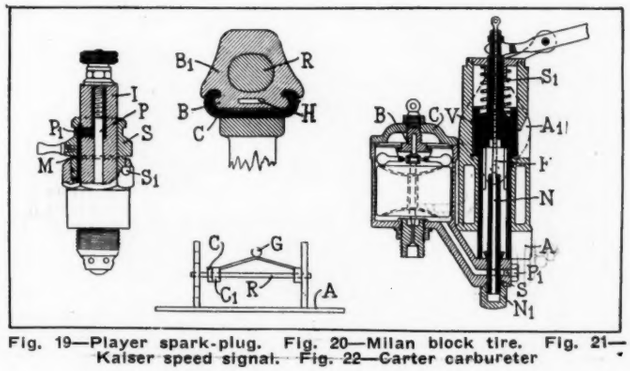


Fig. 19—Player spark-plug. Fig. 20—Milan block tire. Fig. 21—Kaiser speed signal. Fig. 22—Carter carbureter

English Test Solid Tires

Truck Department of the N. A. A. M. Presents Article by A. E. M. Turner Who Praises American Product

Blames Road Conditions for Small Mileage Obtained by Trucks in This Country

COMPREHENSIVE tests of solid tires in England, covering the use of thirty-seven British automobile trucks ranging in size from 1 to 6 long tons capacities, have been concluded recently with most illuminating results so far as tire mileages are concerned.

The truck represented six different makes, including some motor omnibuses and the average of the whole lot was 17,409 miles per set of six tires and based upon the consumption of three sets to each truck.

The compiler of the figures, A. E. M. Turner, of London, in commenting on the comparative service of tires states that with one exception, the British tire makers are behind those of the European continent and that the American tires were as good or better than those of the continental factories. In the face of the fact that users of American trucks get materially lower figures in miles than the appended table shows, the comment of Mr. Turner on the quality of American tires seems to prove that road conditions are accountable. In THE AUTOMOBILE last summer it was shown that the average of 1,000 truck tires in actual use was somewhat in excess of 11,000 miles. The British experience shows that the average guarantee of American tire makers is on the conservative side.

The article of Mr. Turner is presented by the truck department of the National Association of Automobile Manufacturers, as follows:

"The mileage shown as the result of using a particular size of rubber is the figure obtained from wearing out three sets of six rubbers, or eighteen tires in all. These results are all from vehicles used in actual service—not from manufacturers' demonstration machines—and have come from two or three vehicles each of the same make and load capacity in the different sets of results. To wear out eighteen tires might take a truck four years or more, and then even this would not give a representative result, as, while one truck might have an exceedingly careful driver who might get an extra 1,000 or even 2,000 miles out of his tires, three vehicles would be more likely to have average treatment meted out to them.

"All mileages given are for the band type of tire. Pressed-in or grip tires are used very little in England. The figures are from records kept on the services of large business concerns. (In making comparisons with American vehicles it should be remembered that English motor trucks are rated in long tons, equivalent to 2,240 pounds.)

"The six makes of chassis appearing in the table are the products of the following manufacturing companies:

Chassis	Manufacturer	Location
Karrier	Clayton & Co., Ltd.	Huddlesfield
Lacre	Lacre Motor Car Co., Ltd.	Letchworth
Leyland	Leyland Motors, Ltd.	Leyland, Lancashire
Commer	Commercial Cars, Ltd.	Luton
Belsize	Belsize Motors, Ltd.	Clayton, Manchester
Hallford	J. & E. Hall.	Dartford, Kent

"The Lacre 2-ton chassis has a four-cylinder 30-horsepower engine, which is exceptionally large for a British 2-ton truck, the average horsepower of seven makes of this capacity being 20 horsepower. The Lacre company have no engine between a two-cylinder 18-horsepower model and its 30-horsepower, four-cylinder engine.

"The remaining well-known make, the Dennis, has been purchased principally by McNamara & Company, Ltd., the big motor haulage contractors of Finsbury, London, E. C., but they will not part with tire mileages. The Dennis chassis are all fairly small-wheeled machines—32 and 34 inches all around—and I have heard various complaints of tire trouble in connection with them. I think the fact of the matter is that if a cheap, undersized or defective rubber has been fitted to a small wheel it simply hastens the collapse of the tire, but does not necessarily destroy it. As you no doubt know, an inferior tire seldom wears out, but it gets destroyed easily in ordinary use, collapses, leaves the rim or band, etc.

"London motor buses, running on 4-inch singles, front, and 4-inch twins, rear, fitted exclusively to cast steel wheels, give about 21,000 miles per set of six rubbers on an average. Peter Union (German) tires are instrumental in getting this big average.

"Trucks and wagons with live-axle types of final drive give, under fair treatment, a bigger mileage from tires than chain-driven chassis, mainly owing to the nice take-up of the drive.

"Of the few remaining cases in Britain where the driver is seated over the engine, it is found that the life, particularly of the front rubbers, is greatly decreased. The weight on the front rubbers is greatly increased, and the tendency, as the vehicle is being propelled over the road, is for them to be driven into the road. It is, therefore, most economical to have the engine under a bonnet, from the point of view of tire economy.

"The writer would like to add that he has been fairly actively in touch with rubber tires since 1892, and whether in carriage or solid motor tires, he has always found American rubber tires either distinctly better in quality, or at any rate as good as the best Continental tires. The main fault which I found in American tires was that there was not enough wearing rubber in them. They were merely shallow pads round the rim, and so we did not get a great mileage out of them. Their rubber, however, invariably wore with perfect evenness."

Capacity Rating, tons	Tire Sizes—Front, single, inches	Tire Sizes—Rear, twin, inches	Mileage, per set of six tires	Loads Carried—Out, tons	Loads Carried—Return, tons about	Nature of work	Where used
KARRIER CARS							
1	32x3	32x2½	21,700	1¼	¼	Ry. parcels dely.	London
1½	32x3	32x3	19,867	1½	¾	Liquor delivery	London
2	32x3½	36x3½	22,180	2¼	1½	Cotton transport	Provinces
2½	32x4	36x4	17,360	2½	¾	General hauling	Provinces
3	32x4	36x4	15,841	3	?	Oil tank wagons	Provinces
4	32x4½	36x4½	16,180	4¼	3½	Cotton transport	Provinces
LACRE							
1	34x3	34x2½	23,200	¾	¼	Drapery & furn.	London
1½	34x3½	34x3½	16,870	1½	1½	Carpet cleaning	
2	34x4	34x4	18,740	2	2	Carpet cleaning	
3	34x4	34x4	15,460	3¼	Empty	Haul. cases from docks	
4	34x4½	34x5	21,863	4	2¼	Gas hardware & supplies	
5	34x5	40x5½	16,910	5¼	1½	Building material	
LEYLAND							
1	34x3½	34x3	24,670				
1½	33x4	34x4	21,721	1	½	Mineral water	Provinces
2	33x4	35x4	17,102	1½	¼	Furniture delivery	London
2½	33x4	36x4	17,008	2	1¼	Bottled beer	London
3	33x4½	37x4	15,200	3½	2	Bottled beer	London
4	34x5	40x5	16,800	4	2½	Beverages	
5	34x5½	40x5½	15,060	5	4½	Beer and cotton	
6	34x6¼	40x6¼	15,780	6¼	2	Barreled beer	
COMMER							
1½	32x3	32x3	20,900	1¼	¼	Paper	
2	32x3	32x3	15,840	2	¾	Gas hardware	London
3	34x4	34x4	16,974	3	½	Provisions	
4	34x4½	34x5	15,602	4	1½	Furniture	
5	36x5½	40x5	16,002	5	3	Building materials	
6	36x6	40x5½	14,865	5½	2¼	Contract haulage	
7	36x6¼	40x6¼	12,304	6½	3½	General haulage	Pickfords
BELSIZE							
1	32x2½	32x2½	18,885	1¼	¼	General haulage	
1½	32x3½	32x3	17,570	1½	1½	Cotton transport	
3	36x4½	36x4	16,975	3	1½	Machinery transport	
5	36x5½	36x5	14,090	5¼	4½	Cotton transport	
HALLFORD							
1½	34x3	36x3½	17,508	1¾	1¼	Laundry delivery	
2	34x3	36x3½	14,986	2	1	Boots and leather	
2½	34x4	40x4	16,808	2¼	1¼	Contract haulage	
3	30x4	40x4	13,962	3	2	Gen. contract haulage	
4	30x4½	40x4½	14,670	4	2	Bottled beer dely.	
5	32x5½	40x5½	16,680	5	1½	Barreled beer dely.	

Truck Rating and Weight

Commercial Vehicle Committee of N. A. A. M. Studies Relation of Chassis Weight to Rated Capacity

Considers Both Gasoline and Electric Machines—Fair Degree of Uniformity Shown

IN the accompanying table are given the averages of the actual weights of American motor truck chassis of the various load capacity ratings, as supplied by the manufacturers of 325 gasoline vehicles and forty-nine electric models. Also, the means of the average weights corresponding with the curves shown on the accompanying chart; and for comparison the average of the weights of from three to ten most successful makes of trucks in each capacity rating.

For example, the average of the chassis weights of forty-nine different makes of 3-ton gasoline trucks is 5,509 pounds. To bear a uniform relation to the average weights of all other capacities the weight should be 5,600 pounds. But the average of actual weights of ten well-known and successful makes of three-ton trucks is 6,070 pounds, which exceeds the average of the 49 makes by 470 pounds. On the chart the dots indicate the average actual weights in the capacities most numerously represented.

Reference to the table will show that in most truck sizes the average weights of the selected few representative makes of gas trucks is in excess of that of all makes combined. The conclusion is that the companies that have had most experience rate their trucks lower or build them heavier and stronger than the new makers.

The weight of the body is an important factor in the problem presented but as the weight of similar body types is generally proportionate the lesson taught is valuable even without including the body weight in the summaries and averages. The accompanying article was formulated and presented by the Commercial Vehicle Committee of the National Association of Automobile Manufacturers and is one of a series of important publications touching the theory and practice of automobile truck engineering and operation.

These articles so far have included the distribution of trucks which appeared in last week's issue of THE AUTOMOBILE and the English tests of solid tires on the opposite page.

LOAD RATINGS AND CHASSIS WEIGHTS OF MOTOR TRUCKS

GASOLINE VEHICLES

Capacity rating (pounds)	No. of models reported on	Average actual chassis weight (pounds)	Means of all chassis weights (pounds)	Average weight or 3 to 10 leading makes (pounds)
500-800	11	1221	1300	1373
1000	23	1786	1780	1728
1200	10	1880	2000	....
1500	34	2190	2400	2331
2000	46	2986	2900	3230
3000	30	3727	3750	3536
4000	44	4505	4500	4721
5000	4	5125	5050	5233
6000	49	5509	5600	6070
7000	10	6080	6100	6100
8000	16	6423	6550	6500
9000	3	6381	7000	....
10000	32	7603	7400	8232
11000	1	7800	7750	....
12000	4	7920	8150	....
13000	3	8966	8550	....
14000	2	8700	8900	8700
15000	..	....	9300	....
18000	..	....	10500	....
20000	3	11240	11250	9860
	325			

ELECTRIC VEHICLES

500-800	7	2375	2375	2540
1000	11	2755	2750	2700
1500	3	3518	3300	3350
2000	7	3525	3800	3716
2500	4	4270	4300	....
3000	2	4124	4750	....
4000	6	5592	5600	5439
5000	..	....	6250	....
6000	1	7000	6900	7000
7000	4	7439	7400	7851
8000	..	....	7850	....
10000	3	8438	8700	8438
12000	1	10000	9500	....
	49			

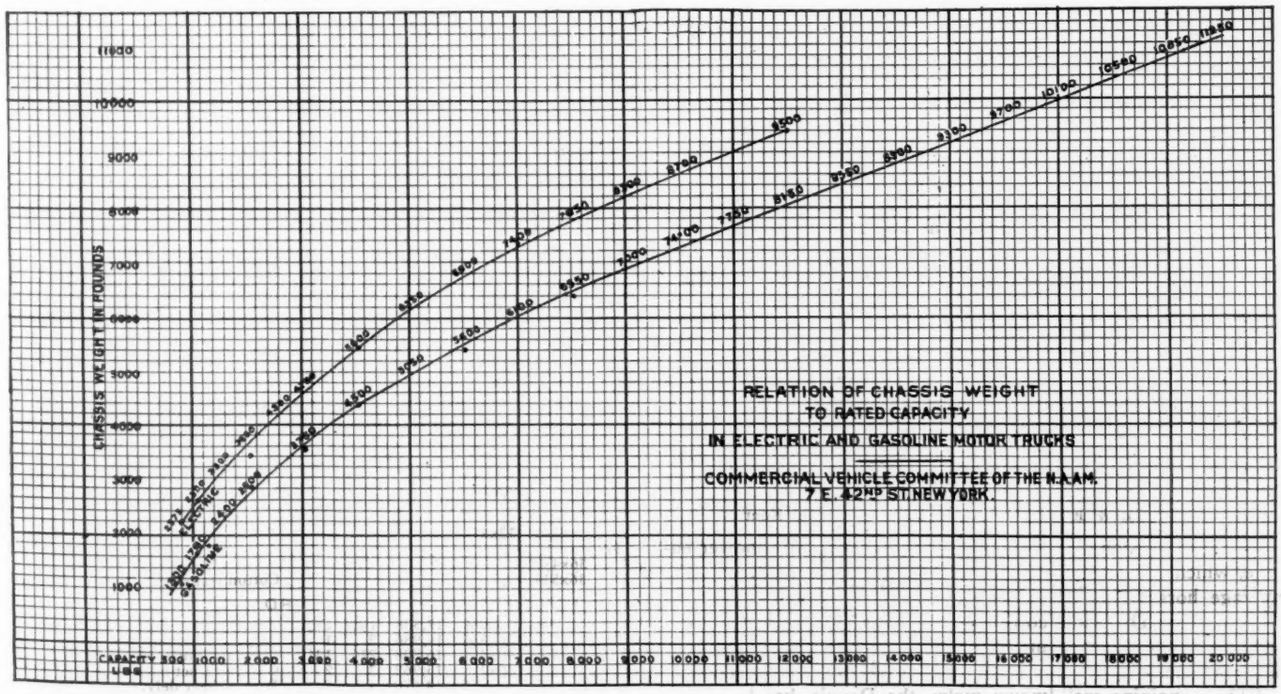
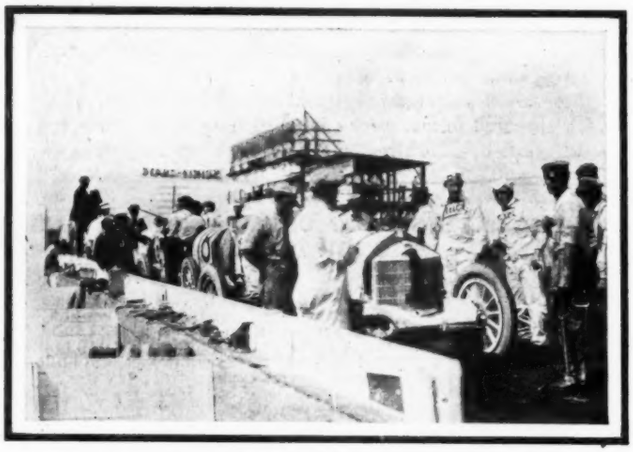

CHASSIS WEIGHT IN POUNDS
RELATION OF CHASSIS WEIGHT
TO RATED CAPACITY
IN ELECTRIC AND GASOLINE MOTOR TRUCKS
COMMERCIAL VEHICLE COMMITTEE OF THE N.A.A.M.
7 E. 42ND ST. NEW YORK.

Diagram constructed by the Commercial Vehicle Committee of the N. A. A. M. showing relation of chassis weight to rated capacity



Knox and Benz at the pits waiting for the start

De Palma a close second and Mulford right behind. The Benz, except for three laps, the first, the twenty-third and the twenty-fourth, had been the leading car so far throughout the entire distance of 203 miles. It looked as though the three would finish in the order named above. Each was maintaining terrific speed, and no change in their relative positions took place until the thirty-fifth, or next to the last lap. Bergdoll was about a minute in the lead of De Palma, when on the back stretch he was forced to stop for tire change. This gave De Palma an opportunity for the second time that day, and in the thirty-fifth lap he passed the Benz car while it was still making the tire replacement. There was no stopping him now, and Bergdoll was obliged to cross the tape second to the Italian, after practically leading the field from the start of the 305-mile run.

Mulford did not finish his race. On the thirty-third lap, when nearing the grand stand, he was overcome by the intense heat, and nearly relinquished control of the speeding Knox. His mechanician leaned over and guided the big car to the pit. Mulford was lifted from the machine and assisted to the hospital tent by Referee Beecroft, while his mechanician, William Chandler, jumped into the driver's seat. One of the pit attendants got in beside him and the Knox was sent away again to make the remaining three laps.

Big Crowd on Friday

ON Friday the Jenks Trophy, Aurora Trophy and Illinois Trophy events were run simultaneously before a crowd only slightly less than that which viewed the larger races of Saturday. Merz in the Stutz was the winner of the Illinois Trophy event, while his teammate, Anderson, was a good second. These two cars were the only ones to finish the race of twenty-four laps, or 203 miles and 1,896 feet. The Rayfield and National entries in this race did not finish, the former driven by Hobbs, being out in the third lap with a broken crankshaft bearing, and the National, piloted by Whalen, being obliged to quit the race after nine laps on account of a break in the magneto drive. This left the two Stutz cars the contenders for first place in this event, which was the longest of the day.

Merz led the Illinois Trophy race from the start, while up to the eighth lap Whalen in the National was a close second, cutting down the former's lead with each lap up to the fifth. In completing the fourth lap it looked as though Whalen might overtake his rival, so quickly had he gained. At the end of the fourth lap the time of the two leaders was as follows: Merz, Stutz—30:20; Whalen, National—30:44. Merz made this fourth lap in just 1 second less than Whalen, completing the circuit in 7 minutes and 34 seconds. In the next lap, however, Merz made the fastest time of his race and increased his lead over the National by 9 seconds. His time for this lap was 7 minutes and 28 seconds.

Anderson Passes Whalen

Whalen retained second place up to the eighth lap, while the other Stutz, driven by Anderson, was fast gaining. It was at the completion of his eighth lap that the latter succeeded in nosing out the National for second place. Whalen completed another lap, and was on his tenth circuit when misfortune overtook him and put his car out of the race. The magneto coupling broke and the damage proved of such magnitude that he was compelled to withdraw from the big races of Saturday.

Whalen's dropping out left the race entirely in the hands of the Stutz cars, which had a merry time of it together from the ninth lap to the finish. Both cars continued to perform consistently to the end, Merz maintaining his lead over Anderson

TABLE SHOWING PRINCIPAL FEATURES OF CONSTRUCTION AND EQUIPMENT OF THE CARS WHICH RACED AT ELGIN

Car No. 1st day	Car No. 2d day		Magneto	Ignition System	Carbureter	TIRES Make Front-Rear	TIRES Size Front	TIRES Size Rear	Gear Ratio	Speeds	Direct Drive	Shock-Absorber	Oil
	1	**Knox Six**	Bosch	2-spark Independent	Rayfield	Michelin	36	37	1 95/100	3	3	Mondex	
							4½	5					
	2	**Mercedes**	Bosch	Double	Rayfield	Michelin	34	35		4	3	Truffault-Hartford	
							4	5				Mercedes rear	
41	3	**Mason Spl**	Splitdorf	Dual	Schebler	Michelin	32	32	2 3/5	3	3	Mondex	
							3½	3½					
	4	**Mercedes**	Bosch	Double	Rayfield	Michelin	32	37	1⅞	4	3	Mercedes	
							4	5					
	5	**Fiat 70**	Bosch	Double	Rayfield	Michelin	34	35				Truffault-Hartford	
							4	5					
32	6	**Falcar**	Splitdorf		Rayfield	Michelin	32	32	2 11/19	3	3	Truffault-Hartford	
							4	4					
21	7	**Stutz**	Splitdorf		Schebler	Michelin	34	35	2 1/3	3	3	Truffault-Hartford	Monogram
							4	5					
	8	**Benz**	Bosch	2 magnetos	Benz	Fisk	36	36		4		Benz	
							4	4½				Mondex	
	9	**Fiat**	Bosch	Double	Rayfield	Miller	34	35				Truffault-Hartford	
							4	5					
33	10	**Falcar**	Splitdorf		Schebler	Michelin	34	34	2 10/19	3	3	Truffault-Hartford	Polarine
							4	4					
23	11	**National 40**	Splitdorf		Schebler	Michelin	34	34					Oilzum
							4	4					
24	12	**Stutz**	Splitdorf		Schebler	Michelin	34	35	2 1/3	3	3	Truffault-Hartford	Monogram
							4	5					
35	14	**Mercer**	Bosch		Rayfield	Firestone	32	32	2½	3	3	Truffault-Hartford	Monogram
							4	4					
36	15	**Mercer**	Bosch		Rayfield	Firestone	32	32	2½	3	3	Truffault-Hartford	Monogram
							4	4					
42		**Ford**	Bosch	Single	Kingston	Prowadink Michelin	30	30	3	Planetary		None	
							3	3½					
43		**Herreshoff**	Bosch	Single	Rayfield	Michelin	32	32	2⅞	3	3	Truffault-Hartford	
							3½	3½					
31		**Mercer**	Bosch		Rayfield	Firestone	32	32	2½	3	3	Truffault-Hartford	Monogram
							4	4					
34		**Mason**	Splitdorf		Rayfield	Michelin	32	32	2 3/5	3	3	Truffault-Hartford	
							4	4					
22		**Rayfield 6**	Mea		Rayfield	Michelin	35	35	2½	4	3	Mondex	Oilzum
							5	5					

practically as at the tenth lap. In his twelfth lap, however, Merz lost 50 seconds when he was obliged to stop at his pit for gasoline and oil. He was off again with a lead of but 8 seconds for the twelfth lap over his rival, Anderson. The latter took advantage of this opportunity to cut down the breach between himself and Merz and on completing the next lap the leader maintained his position by a margin of only 2 seconds.

In the following lap, however, Anderson was compelled to stop at the pit to take on gasoline and oil, losing 30 seconds for this, giving Merz a lead of 1 minute and 4 seconds for the fourteenth lap. From this time on until the end of the race the two cars stayed about the same distance apart. Anderson's fastest lap was his tenth, which he negotiated in 7 minutes and 31 seconds, 3 seconds slower than Merz's fastest of 7 minutes and 28 seconds.

The two pit stops for lubricant and fuel were the only ones made during the entire race, no tire trouble being met with by the two cars. Merz completed the race in 184 minutes and 32.25 seconds, while Anderson made the twenty-four laps in 186 minutes and 14.15 seconds. Merz averaged 66.11 miles an hour for the long grind of 203 miles.

Six cars in the Aurora Trophy race limited to machines of from 201 to 300 cubic inches piston displacement, were the next to be sent off by Starter Fred J. Wagner amid a cloud of smoke and in order according to their entry numbers.

Hughes Takes Lead and Holds It

Hughie Hughes in his Mercer, although the last to start, got the lead on the first lap and retained that position throughout the entire race of 152 miles. His time for the initial lap was 7:52, one of slowest of his race. His team-mate, Spencer Wishart, was in second position for three laps. In the fourth lap, giving up this position to Pullen in another Mercer. The latter did not lose this position throughout the rest of the race crossing the tape second to Hughes.

Hughes piloted his car at the average rate of 65 miles an hour, while Pullen's average speed was 62.3 miles an hour. The former made his fastest time on the next to the last lap, making the course in 7:23. Pullen's time on his fastest lap was 7:48.

The little Mason, driven by Roberts, ran a good race coming into third place on the fourth lap and staying in this position up to the fifteenth except for the ninth when Wishart succeeded in nosing it out and only momentarily, however. In the sixteenth Trussel in a Falcar gained third position and the Mason was

Velie truck used to transport the militia guards

unable to head it off in the remaining three laps of the race.

Hughes ran a consistant race throughout, stopping only once at the pit when he was far in the lead and even this stop was unnecessary. He informed the pit attendants that his teammate, Pullen, had blown a tire on the back stretch. Wishart was obliged to stop at the pit in the eleventh lap for tire change. He ran two more laps and was obliged to drop out of the race because his oil lead broke, together with his water pump, beyond immediate repair. The other five starters completed the race. In the fourteenth round Roberts was forced to stop his Mason to tighen up the shock-absorbers on his car which, due to its light weight, was hard to hold on the road, especially on the rougher back stretch.

The fastest lap of the entire race was run by Hastings in a Falcar who in his ninth circuit succeeded in making a time of 7:22. Hughes' fastest lap was 1 second slower than this. He was not pushed, however, and no doubt could have cut his time down considerably had it been necessary.

Hughes' taking of this year's Aurora Trophy race makes him a two-time winner of this event.

The Jencks Trophy event went to Mason entry No. 41 which

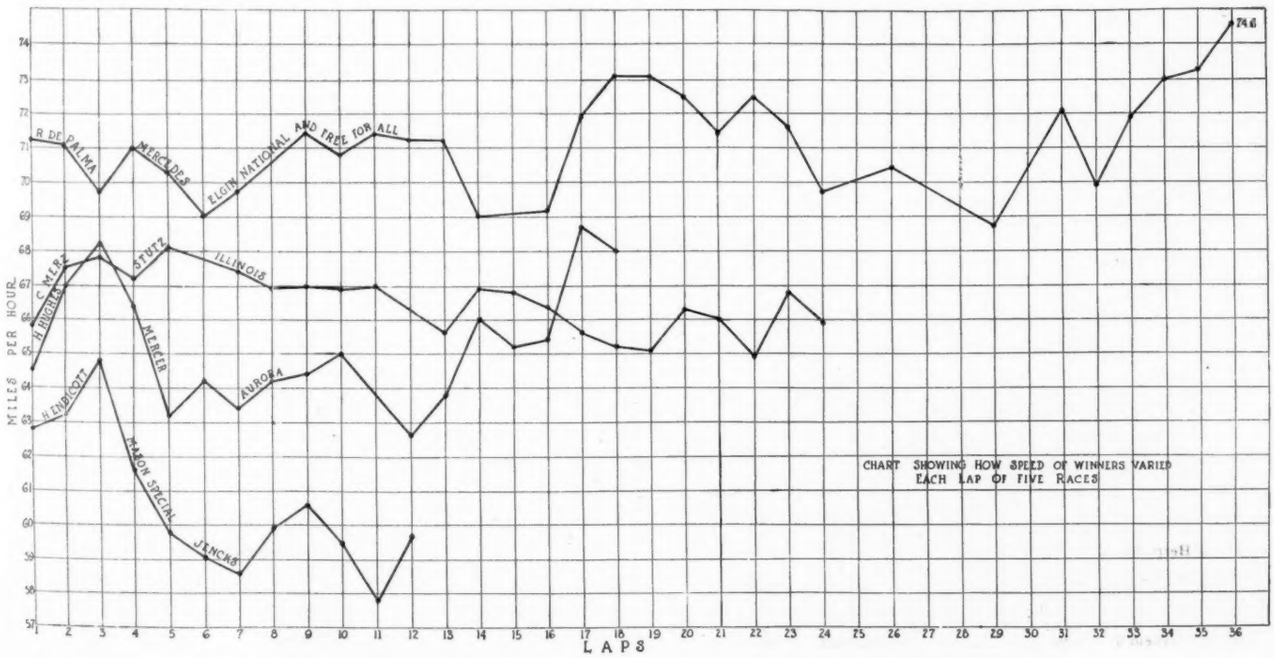


Chart showing variations of running speed of the winners of each race run at Elgin last week

Technical Aspect of Race

Car Design and Equipment Showed Numerous New Features

THE most marked feature of the Elgin meet was the small amount of tire trouble which even the bigger cars had. There were twenty-five recorded cases of tire replacement for the 2 days' racing, and on the first day, when the lighter cars performed, only two stops were made at the pits for tire changes. These were both in the Aurora trophy race, as neither car in the Jencks race nor in the Illinois trophy event had to slacken its speed for this purpose. This applies to the cars which finished in the several events.

Saturday's races saw sixteen tire replacements at the pits, ten of which were right rear tire changes, four left rear and a front change. On numerous occasions when it was necessary to stop at the pits for tire changes advantage was taken of the forced wait to refill oil and gasoline tanks.

On the second day's racing, seven pit stops were made to refill oil, gasoline and water tanks, two to change driver, and one for carbureter adjustment. On the previous day two stops were made to replenish tanks, one for carbureter adjustment and one for the tightening of shock-absorbers. The total number of stops on Friday was six and on Saturday twenty.

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was driven by Endicott at an average speed of 60.7 miles an hour. He had practically no opposition throughout the entire race and was the only one of the three starters to complete the run of 101 miles and 3,588 feet, or twelve laps. His total time was 100 minutes and 42.9 seconds. The other two entries were Ford and the veteran Herreshoff driven by Wordingham. It was too bad to push this well-known car into a race when it was not in condition and it was out of the race after one lap on account of a broken wheel. It was, however, running an easy second to Endicott's Mason when the accident occurred.

The Ford entry driven by Henning, which was another veteran, completed six laps when it was ditched and put out of the race permanently. Its performance, though slow, was consistent for the 50 miles which it ran. After it was put out of the race Endicott had things all his own way and finished in his own time without a single stop for tire change or for adjustment of any kind, but keeping his machine humming along at a fast pace all the way to the finish line.

Practice troubles were few on the first day; there were no tire changes and the only other two breakdowns were those of Mulford, who broke his crankshaft, and of Hobbs, driving a Rayfield, who burned out an engine bearing. On Saturday, however, Tetzlaff, while in practice, put his car permanently out of the race by shearing one of the differential gears.

A noticeable feature of the Herreshoff entry was that the tires were carried on clincher rims and not on quick-detachable racing rims, which all the other cars used. Wordingham, who drove the car, was obliged to depend on the tires which were on the machine to last throughout the race as, had he been obliged to replace a damaged tire by the clincher method, the time required would have been sufficient to put him out of the running. The Rayfield car carried no extra tires and would have been obliged to run on a damaged shoe from any part of the course back to the pit.

Attention should be called to the fact that none of the cars were stock machines and all were entered under Class C, which requires that the manufacturers must have made at least fifty of the machines for the previous season. Most of the larger cars had been seen before by the racing fraternity and presented no strikingly new features of construction. The Benz car had its rear wheels provided with thin aluminum disks which were bolted to the spokes. This was done with the idea of reducing wind resistance and not for strengthening the wheels, as the metal was too thin for that purpose.

Most of the cars had the conventional type of racing-car exhaust, although the Mason entries had their exhaust pipes coming upward through the tops of the hoods, a feature which no doubt was of great annoyance to the drivers of these machines. The other cars, with the exception of the Ford and the Knox, exhausted below the chassis. The big Knox Six had an exhaust pipe for each cylinder, the six pipes coming out of the left side of the hood. The Ford car was nearly ruled out of the race because the exhaust manifold had been completely removed and no other scheme had been adopted to lead the gases outside of the hood. F. E. Edwards, Chairman of the Technical Committee, at first refused to let the car start, but later stretched a point and permitted it to enter the race, after the lower half of the hood on the exhaust side had been removed, permitting the gases to escape into the air.

The Mason cars were the only ones in the races which had left-hand drive, while Hugh Hughes' Mercer was also distinctive in that it was provided with wire wheels. In making tire changes, the entire wheel was removed and an extra wheel quickly put in its place. This method was undoubtedly faster than that of the other contestants who used demountable rims and many were favorably impressed with the wire wheel showing, both for aiding in keeping the car on the road and for the quick tire change feature.

TABLE SHOWING THE POSITIONS OF THE CONTESTANTS DURING EVERY LAP OF THE FREE-FOR-ALL

No.	Car	Driver	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1	KNOX SIX	R. Mulford	3	3	2	3	3	2	2	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	2	3	2	3	3	3	3	3	3	3	3
2	MERCEDES	C. Clark	6	6	6	6	4	Out																																
4	MERCEDES	De Palma	1	2	3	2	2	3	3	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	1	1	2	3	2	3	2	2	2	2	2	2	2	1
5	FIAT 70	T. Tetzlaff	5	5	5	5	5	4	4	4	4	4	4	4	4	5	5	5	5	4	4	4	4	4	4	4	4	4	Out									
8	BENZ	E. Bergdoll	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2
15	MERCER 35	H. Hughes	4	4	4	4	6	5	5	5	5	5	5	5	5	4	4	4	4	Out																		

TABLE SHOWING THE POSITIONS OF THE CONTESTANTS DURING EVERY LAP OF THE ELGIN NATIONAL RACE

No.	Car	Driver	Lap 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
4	MERCEDES	De Palma	1	1	2	1	1	2	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	KNOX SIX	R. Mulford	2	2	1	2	2	1	1	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	STUTZ	C. Merz	4	4	5	4	3	3	4	3	5	5	5	6	7	4	7	7	7	6	6	6	4	4	4	4	3	3	3	3	3	3
3	MASON SPL	M. Roberts	7	7	7	8	9	8	8	8	8	8	8	8	8	5	6	6	6	5	5	5	5	5	5	5	4	4	4	4	4	4
7	STUTZ	G. Anderson	4	4	4	5	4	4	3	5	3	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	5	5	5	5	5
5	FIAT 70	E. Hearne & G. Dix	6	6	6	6	6	5	5	4	4	3	3	3	3	7	8	8	8	7	7	7	6	6	6	6	6	Out—Transmission trouble.				
14	MERCER 35	S. Wishart	8	8	8	9	8	7	7	7	7	7	7	7	6	6	5	5	4	4	4	4	7	7	7	7	Out—Broken oil lead and water pump.					
15	MERCER 35	H. Hughes	3	3	3	3	7	6	6	6	6	6	6	5	5	5	4	4	5	Out—Burned out crankshaf tbearing.												
2	MERCEDES	G. Clark	9	9	9	7	5	Out—Car skidded—ran into fence—broke both rear wheels.																								
6	FALCAR	H. Hastings	Car not in racing condition.																													
10	FALCAR	G. Trussel	Car not in racing condition.																													
11	NATIONAL 40	N. Whalen	Magneto drive damaged on Friday, putting car out of race.																													

Ralph De Palma's Story

Driver Who Won Double-Header Describes the Race

SOME interesting sidelights on the feature races of Saturday were told by Ralph De Palma, who stated that without a doubt it was the hardest contest in which he had ever participated. The weather was the hottest which has visited the Middle West this year, and the boiling sun beat down furiously upon the speeding drivers, much to their discomfiture. According to De Palma, the back stretch was the hottest, and was very much like an oven, despite the fact that the big Mercedes which he was driving was traveling at a speed of over 70 miles an hour. The heat from the engine swept directly back to the cars and occupants to add to that from the sun's rays.

De Palma changed three tires during the 305-mile run, all at the pits. This, of course, means that after each blow-out he drove for some distance on the flat damaged tire or rim. It was quicker to do this than to have to stop at the point at which the tire gave way, since the facilities for changing were better and more rapid at the pit. The Italian used a total of 29 gallons of gasoline for the thirty-six-lap free-for-all race, thus averaging 10.5 miles to the gallon. His tank has a capacity of 38 gallons, and while at the pit on one occasion he took on 10 gallons and the tank was half full at the end of the race.

Speaking of the course, De Palma stated that it was one of the best on which he had driven, and that it was an easy matter to pass any other car, the width being amply sufficient. At 90 miles an hour the slight roughness of the road surface is not noticeable at all, he stated, while at 60 miles the unevenness is perceptible, but is by no means a disturbing factor. The course is better than that over which the French Grand Prix is run in that respect, as in that event he was frequently obliged to run along for some 15 miles on the course before being able to pass any other car.

Perhaps the most interesting feature of De Palma's races and the one which brings out the obstacles with which he had to contend to win Saturday's events was that from the tenth lap on he was unable to throw out the clutch, it remaining frozen for the remaining twenty-six laps. He was having trouble with his clutch before the race, and delayed the start for 10 minutes while his attendants tried to put it in good condition. Had it been necessary for him to stop on the back stretch for any purpose, he could never have been able to start again. To change gears at that time it was necessary to speed the motor up to what was judged to be the correct speed, then to jam in the gears and run the chance of stripping them. This requires intimate knowledge of the motor's operation. When he stopped his car for tire changes at the pit it was necessary to stop the motor. It was in starting it again that the greatest chance of damage was run. The rear wheels rested in a pool of oil, and the fact had much to do with the prevention of harm to the transmission. If the motor had been speeded up sufficiently, De Palma threw in the lower of the two gears, which he was able to use, putting the strain immediately on the rear wheels. The oil allowed them to spin around in getting the car going again and gave sufficient flexibility to prevent damage. The Mercedes clutch is of the special spring type, the spring being coiled around a drum, and contracting on it when engaged. The drum became cracked, spreading out and jamming within the spiral, rendering positive and unalterable connection between the engine and transmission.

On the twenty-ninth lap the air pressure in the gasoline tank became so great that it was necessary to stop at the pit to reduce it. It had reached about 8 pounds to the square inch.

Some mechanical details of the Mercedes which De Palma drove may be of interest. The motor has a bore of 131.8 millimeters and a stroke of 180 millimeters, giving it a piston dis-

Table Showing the Fastest Lap of Each Entry and Speed of Same, as Compared with Piston Displacement

No.	Name	Bore	Stroke	Piston Displacement cu. in.	Fastest Lap	Time	M.p.h.
	JENCKS TROPHY RACE						
41	Mason Special	3 13-16	5	228	3	7:51	64.62
43	Herreshoff	3 3-8	3 5-16	133.6	1	10:49	47.00
42	Ford T	3 3-4	4	176.7	5	11:52	42.8
	AURORA TROPHY RACE						
36	Mercer	4 3-8	5	300.17	17	7:35	66.9
35	Mercer	4 3-8	5	300.17	8	7:39	66.4
31	Mercer	4 3-8	5	300.17	15	7:48	65.1
34	Mason	3 7-8	5	235	11	7:58	63.62
37	Falcar	4 1-8	5 1-4	280.6	16	8:58	56.7
32	Falcar	4 1-8	5 1-4	280.6	7	9:38	52.7
	ILLINOIS TROPHY RACE						
24	Stutz	4 3-4	5 1-2	390	6	7:30	67.6
21	Stutz	4 3-4	5 1-2	390	12	7:35	66.9
23	National	5	5 11-16	448	4	7:35	66.9
22	Rayfield	4	5 1-2	414.6	1	8:35	59.1
	ELGIN NATIONAL TROPHY RACE						
8	Bergdoll	6.2	6.3	780	3	6:51	74.1
1	Knox	4 3-4	5 1-2	584.8	28	6:54	73.6
4	Mercedes	5.17	7.08	588	36	6:49	74.4
5	Fiat	5	7 5-8	598	13	7:09	71.0
15	Mercer	4 3-8	5	300.17	4	7:16	69.9
2	Mercedes	5 1-8	7 1-8	587.9	4	7:21	69.1
7	Stutz	4 3-4	5 1-2	390	15	7:25	68.4
12	Stutz	4 3-4	5 1-2	390	30	7:27	68.2
14	Mercer	4.39	5	301	20	7:32	67.4
3	Mason	3 7-8	5	235.8	22	7:44	65.7

This table shows the consistent performance of the cars when displacement and weight are considered.

TABLE SHOWING THE POSITIONS OF THE CONTESTANTS DURING EVERY LAP OF AURORA TROPHY RACE

No.	Car	Driver	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
31	MERCER	N. Pullen	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
32	FALCAR	H. Hastings	6	4	4	4	2	6	6	6	6	6	6	6	6	5	5	5	5	5
33	FALCAR	H. Trussel	5	5	6	5	5	5	5	5	5	5	4	5	5	4	4	3	3	3
34	MASON	M. Roberts	4	6	5	3	3	3	3	3	4	3	3	3	3	3	3	4	4	4
35	MERCER	S. Wishart	2	2	2	6	4	4	4	4	3	4	5	4	4	Out				
36	MERCER	H. Hughes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE SHOWING THE POSITIONS OF THE CONTESTANTS DURING EVERY LAP OF ILLINOIS TROPHY RACE

No.	Car	Driver	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
21	STUTZ	G. Anderson	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
22	RAYFIELD	W. Hobbs	4	4	Out																					
23	NATIONAL	N. Whalen	2	2	2	2	2	2	2	3	3	Out														
24	STUTZ	C. Merz	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE SHOWING THE POSITIONS OF THE CONTESTANTS DURING EVERY LAP OF JENCKS TROPHY RACE

No.	Car	Driver	1	2	3	4	5	6	7	8	9	10	11	12
41	MASON SPL	H. Endicott	1	1	1	1	1	1	1	1	1	1	1	1
42	FORD 1911	Henning	3	2	2	2	2	2	Out					
43	HERRESHOFF 20	W. G. Wordingham	2	Out										

Harking Back a Decade

What Stirred the Automobile World 10 Years Ago—High Price of Gasoline—Racing on Road and Track

Chicago Automobile Facilities Transported More Than 2,000 Persons Every Day

FROM *The Automobile and Motor Review*, September 6, 1902: Every day from 2,000 to 2,500 persons in Chicago ride in public service automobiles, which have come to displace the horse-drawn carette and various forms of busses. There are at present seventeen motor vehicles divided into six lines which make quick trips through the shopping district.

A. C. Newby, of the National Electric Vehicle Company, of Indianapolis, has made a run in one of the cars turned out by that company of 118 miles on one charge. An ordinary 44-cell battery was used.

Exports from New York, including cars and parts, for the week ending August 30 amounted to $11,600.

C. A. Benjamin has left Syracuse to take charge of the Chicago branch of the Locomobile Company of America.

The American Bicycle Company, incorporated for $30,000,000 has defaulted on the semi-annual interest payments on its issue of 5 per cent. gold sinking fund bonds and proceedings have been instituted to have the concern adjudicated bankrupt.

Increasing demand for gasoline has served to advance the price of the 90-degree grade from 17 to 19 cents a gallon. While the big majority of automobile owners are comparatively wealthy men, it has been determined to ask the National Association of Automobile Manufacturers to investigate the underlying causes of the advance.

According to a report made to the National Capital Automobile Club, practically every physician of standing in Washington owns at least one automobile.

President Lee H. Smith of the Buffalo Automobile Club reports that the organization now has a membership of 200, which represents probably 1-5 of the total number of automobiles owned in Buffalo.

The Baker torpedo, Winton's Bullet and the Ford racing pair are to be seen at the race meeting which will be held in Cleveland.

The Fords were built particularly for track work and have been pointed for the 10-mile handicap and Australian pursuit races.

The Chicago Automobile Club has adopted a new system of classification for cars entered in its forthcoming meet at Joliet. The formula is to 1-100 of the weight into the horsepower, so as to give the horsepower per 100 pounds and then classify the cars according to similarity of results. Herbert Crane, of Racine, Wis., has adopted the motor vehicle as a means for delivering milk to his customers. Mr. Crane says that he only spends from 15 to 20 cents a day for fuel.

Low wheels came in by degrees. The vehicle world, usually so quick to snap up anything which had the appearance of being good, was peculiarly slow in adopting them. To produce a rigid wheel and at the same time preserve the elasticity so necessary to an easy-riding vehicle has been the aim of the manufacturers for years. It was not until the advent of pneumatic tires that the opportunity of accomplishing such a result became possible.

While there is a certain amount of opposition to all forms of automobile racing, we believe that the great majority of American motorists, including the makers, are in favor of a continuance of the sport on the road as well as on the track.

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placement of 599.2 cubic inches. In English units the millimeter measurements given above are 5.2 by 7.06 inches. The carbureter is a Rayfield, while the magneto is of Bosch make of the two-spark type. The spark was set for 5-16-inch lead. The gear ratio on high is 1 5-8 to 1. There is no direct drive to the car, power being transmitted through gears for all speeds. The horsepower developed by the motor, which is of four-cylinder type, is 37 at an engine speed of 400 revolutions per minute, 90 at 1,650 revolutions and 114 at 1,850 revolutions. The pistons are of cast iron and are fitted with two rings each. At the top, the pistons have a clearance of .03 inch, at the middle .02 inch and at the bottom .015 inch. The clearances are much greater than those given to the average automobile to allow for greater expansion due to greater heat.

De Palma drove this same Mercedes in the Indianapolis races, and no alterations of any consequence have been made in it since then.

Moline Sees Labor Day Hill Climb

MOLINE, ILL., Sept. 3—Over 5,000 people lined the Sixteenth street hill Labor Day morning and watched Jack Stickney, in a stripped Velie, make the best time of the day, taking the free-for-all with a mark of 17 seconds flat. Stickney and Rose, both Velie drivers, carried off a majority of the honors, winning three firsts and a second. Oscar Priester, of Davenport, in a Pope-Hartford, won the Josephson cup in the amateur drivers' class, making the good time of 17 1-5 seconds. The Pope-Hartford cars took second honors with two firsts and two seconds. The summary is as follows:

CARS COSTING FROM $1,000 TO $1,800

Car	Driver	Time
Velie	Rose	20:00
Velie	Stickney	21:80

CARS COSTING LESS THAN $2,000

Velie	Rose	22:00

FREE-FOR-ALL RACE

Velie	Stickney	17:00

CARS COSTING OVER $1,800

Lozier	French	18:00
Pope-Hartford	Petersen	18:20

CARS COSTING $1,000 AND LESS

Overland	Knowles	21:00

CARS COSTING $2,000, CARRYING FOUR PASSENGERS

Pope-Hartford	Priester	18:00
Pope-Hartford	Petersen	19:00

AMATEUR-DRIVEN CARS

Lozier	Priester	17:20
Velie	French	18:20

Manitoba Run to Be on Varied Roads

WINNIPEG, MAN., Aug. 31—To obtain every condition of road in the province from sand, mud, swamp, rough, rocky and the smooth, even, hard-packed roadway, the contest committee in charge of the annual endurance run has decided upon the following route:

From Brandon to Carberry and then from Carberry north to Neepawa and from Neepawa to Brandon.

From Brandon the contestants will return by way of Wawanesa, Glenboro, Treherne, Fannystelle and Starbuck.

This route will give a run of between 350 to 400 miles and will take in every variety of district.

Rain Spoils Brighton Meet

The Labor Day meet held on the Brighton Beach 1-mile track on Monday and which was scheduled to include seven events, was postponed after the fifth because Bob Burman declined to race on the wet track in his new 300-horsepower Blitzen Benz II. This event was announced as the star performance of the day.

The other attractions were a 5-mile match race between an E-M-F and a Bergdoll, the former, driven by Billy Burke, winning in 6:2.35; a 5-mile race between Stutz (Dave Lewis), White

(Kyle) and Marion (Strauss), finishing in the order named, with the Stutz arriving in 5:16.61; the same Stutz and White cars and their drivers against Burman in his Ohio, which was disabled on the homestretch of the first lap. This was won by the White in 5:5.14; the first heat of a match race for the Remy Brassard, between Burman, in Blitzen Benz, Hickman, in a Mercedes, Kyle, in the White, and Grennan, in a Benz, Burman going to a spectacular finish; 25-mile race between two Bergdolls, a Marion, Stutz, White and Cutting, the last driven by Burman and finishing in 25.28.56, beating the White by 12 seconds. The grandstand was filled fairly well despite the inclement weather.

A. A. A. Pathfinder Completes Trip

NEW ORLEANS, LA., Sept. 2—Coated with Louisiana mud, the pathfinder of the American Automobile Association's national reliability tour, a Flanders electric coupé, reached its destination in this city last week. The car was met by a column of 100 local automobiles and was escorted to the city hall where official welcome was extended. The pathfinder was 28 days in covering the route from Detroit.

Much of the highways covered is in excellent shape but the map-maker reports that many miles represent the most primitive stage of road-building. Little tire trouble was experienced en route.

Labor Day Races at Albany

ALBANY, N. Y., Sept. 3—Arthur Lang, of Albany, N. Y., on Labor Day competed with William Earl, of Kinderhook, at Parry's Island and defeated him in a 30-horsepower machine, making 5 miles in 8:11 3-4. The second event was won by Frank Baymer, who made 5 miles in 8:03, and the third event was taken by Sam Shaw in 7:57 for 5 miles. The final event was another 5-mile event which was won by W. Knapp in 9:09.

Garage Show Planned at Omaha

OMAHA, NEB., Sept. 3—Omaha will have a fall automobile show, during the Ak-Sar-Ben carnival week, in order that the 1913 models of the cars may be shown to the thousands of outsiders who come to the city during that time, the last week in September and the first in October.

It will not be held at the auditorium where the February shows are given, but will be a street or garage show. This was decided at a recent meeting of the Omaha Automobile Dealers Show Association.

The garages will be decorated with the association colors, green and white, some of the dealers having worked out elaborate decoration schemes. The Omaha streets are strung with rows of incandescent lights during the carnival, and these will be extended up along automobile row. All of the companies will have a complete line of the new models on display.

It is estimated that the combined automobile show and carnival will induce a large per cent. of the state dealers to visit the city, as many have already signified their intention of doing so. There will be a large number of prospective buyers.

The promise of bumper crops in the state is leading all of the automobile men to predict record sales this fall.

If the Patent Office Took Fire

It is claimed by the *Revue de L'Automobile* that paper can be made incombustible by means of an immersion in a very strong solution of alum and that the result is still better if the immersion is repeated after the first coating has been dried. The method is recommended for the safeguarding of documents, private or public, as it is inexpensive and, far from affecting the legibility and appearance of documents injuriously, even preserves the whiteness and the surfaces of paper to which it is applied.

Calendar of Coming Events

What the Months Ahead Have in Store for the Automobilist—Shows, Conventions, Race Meets, Etc.

American and Foreign Fixtures of Importance Set Down in Chronological Order

Shows, Conventions, Etc.

Aug. 24-Sept. 9....Toronto, Can., Display of Automobiles, etc., at Canadian National Exhibition, Transportation Building.
Sept. 5-15.....San Jose, Cal., Automobile Show, San Jose Automobile Dealers' Association.
Sept. 14-21.....Chicago, Ill., Annual Fall Festival and Show, Chicago Automobile Trade Association.
Sept. 17-20.....Denver, Col., Convention International Association of Fire Engineers.
Sept. 23-Oct. 3.....New York City, Rubber Show, Grand Central Palace.
Dec. 7-22 .....Paris, France, Paris Automobile Show, Grand Palais.
Jan. 4-11.....Cleveland, O., Annual Automobile Show.
Jan. 11-25, 1913...New York City, Thirteenth Annual Show, Madison Square Garden and Grand Central Palace, Automobile Board of Trade.
Jan. 20-25.....Philadelphia, Pa., Annual Automobile Show.
Jan. 25-Feb. 1.....Montreal, Que., Automobile Exhibition, R. M. Jaffray, Manager.
Jan. 27-Feb. 1.....Detroit, Mich., Annual Automobile Show.
Feb. 1-8.....Chicago, Ill., Annual Automobile Show.
Feb. 10-15.....Minneapolis, Minn., Annual Automobile Show.
Feb. 17-22.....Kansas City, Kan., Annual Automobile Show.
Feb. 24-Mar. 1.....Omaha, Neb., Annual Automobile Show.
Feb. 24-March 1...St. Louis, Mo., Annual Automobile Show.
March 3-8.....Pittsburgh, Pa., Annual Automobile Show.
March 8-15.....Boston, Mass., Annual Automobile Show.
March 17-22.....Buffalo, N. Y., Annual Automobile Show.
March 19-23.....Boston, Mass., Annual Truck Show.
March 24-29.....Indianapolis, Ind., Annual Automobile Show.

Race Meets, Runs, Hill Climbs, Etc.

Sept. 29-30.....St. Louis, Mo., Track Races, Universal Exposition Company.
Sept. 9-11.....Chicago, Ill., Commercial Vehicle Reliability Run, Chicago Motor Club.
Sept. 11-14.....Buffalo, N. Y., Third Annual Reliability Tour, Automobile Club of Buffalo.
Sept. 17.....Milwaukee, Wis., Grand Prize Race.
Sept. 20.....Milwaukee, Wis., Wisconsin Challenge and Pabst Trophy Races.
Sept. 21.....Milwaukee, Wis., Vanderbilt Cup Race.
Sept. .....Washington, D. C., Reliability Run, Automobile Club of Washington.
Oct. 7-11.....Chicago, Ill., Reliability Run, Chicago Motor Club.
Oct. 7-20.....National Tour American Automobile Association.
Oct. 12.....Salem, N. H., Track Meet, Rockingham Park.
Nov. 6.....Shreveport, La., Track Meet, Shreveport Automobile Club.

Foreign.

Sept. 26-Oct. 6....Bourges, France, Agricultural Motor Car Exposition.
Nov. 8-16.....London, England, Olympia Automobile Show.
Jan. 11-22.....Brussels, Belgium, Annual Belgian Automobile Show, Centenary Palace.

Grand Prix for 3-Liter Cars—It is announced in *L'Auto* of August 20 that a long-distance road race for "light vehicles" with a maximum cylinder volume of 3 liters will be held in June, 1913, separately from the *Grand Prix* race of the Automobile Club, and not jointly with this event as at the Dieppe race this year. The reason for this decision is that the new regulations for the club's race provide a maximum fuel consumption of 20 liters per 100 kilometers, which provision is so liberal that motors with 100 by 200 millimeters bore and stroke and developing 140 to 150 horsepowers can keep within it, and that consequently mainly cars of very great power can be expected to compete for its honors. As, on the other hand, the public is more deeply interested in cars of smaller dimensions which come nearer to the type usually bought by it, the organizers consider it desirable that the race for 3-liter cars shall be continued from year to year. It is foreshadowed that a maximum fuel consumption lower than 20 liters per 100 kilometers will be stipulated for this race for light vehicles and that it will be placed so low as to bring the superiority in fuel economy for which the European and especially the French automobile industry have been striving, into sharp contrast with the performances of the small American cars whose rapidly increasing sale in the European market is based on merits of a different order and is causing great anxiety.

The Automobile

Vol. XXVII Thursday, September 5, 1912 No. 10

THE CLASS JOURNAL COMPANY
H. M. Swetland, President
C. R. McMillen, Vice-President
W. I. Ralph, Secretary E. M. Corey, Treasurer
231-241 West 39th Street, New York City

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Chicago— 910 South Michigan Avenue
Detroit—1501 Ford Building
Boston—1035 Old South Building
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United States and Mexico---------- One Year, $3.00
Other Countries in Postal Union, including Canada---------- One Year, 5.00
To Subscribers—Do not send money by ordinary mail. Remit by Draft, Post-Office or Express Money Order, or Register your letter.

Entered at New York, N. Y., as second-class matter.
The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

Increasing the Speed

ELGIN, ILLINOIS, with its now-famous 8.5-mile road racing circuit is fast climbing the scale of the Goddess of Speed, and if the promoters continue annually to improve the course it will not be long before it will hold the record for a genuine road course, as it is one of the very few courses over which road races are run in which the natural course of the Illinois roads is followed and in which advantage has not been taken of banked turns of large radius in order to get headliners in the press on the speed attained in miles per hour.

From an average speed of 62.5 miles per hour in 1910 to 66.45 in 1911 and to 68.4 this year in the Elgin race for under 600 cubic inches piston displacement over the same course shows the improvement that is being made in cars and also furnishes fuel to the ever-increasing inquiry, "What is going to be the speed limit of motor cars in road races in America?" These figures must be analyzed carefully; otherwise an increase of over 15 per cent. average speed within a lapse of 2 years might be misinterpreted. During the 1910 and 1911 races competition was limited to stock cars. This year it was a non-stock event, but with the same piston limitations of 600 cubic inches as ruled in the stock régime. It must also be borne in mind that roads are being improved from year to year, that drivers are becoming more expert and also more familiar with the course. With all of these matters considered the fact still remains that cars are annually becoming speedier. The fastest lap of 1910, 64.5 miles per hour was raised to 70.45 last year and carried still onward to 74.5 this year. At this pace the speed in a few years may reach the amazing average of 80 miles per hour for the race and easily 90 miles per hour for a single lap.

Of the many factors that are contributing to higher speed in racing cars, the **reduction in weight of reciprocating parts and car balance must receive premier consideration.** The reducing of piston and connecting-rod weight is becoming more general. With the forged steel piston machined to the minimum weight, with hollow tubular connecting-rods and with but a piston ring or two it is now possible with additional piston clearance to get reliability that endures the tremendous speed of hundreds of miles at over 60 miles per hour. Many engineers who have carved for themselves niches in the motoring temple of fame in pleasure car design, have become discards in racing car design, solely due to lack of familiarity with the unlooked-for strains that continued speed imposes on the car mechanisms. Thanks to French aggressiveness, many of these problems have been sufficiently exploited so that today there are a few milestones to blaze the trail in this comparatively unexplored field of car engineering. To date, where engineers have overstepped prescribed limits in weight reduction there have been breakdowns due to lack of fatigue factors in the parts, these, however, having proven their strength adequate for the short test. The forged piston and light connecting-rod are today in a status similar to that of the steering knuckle parts of 2 or 3 years ago when often half a dozen broke in a single race. Today the broken steering knuckle is an unheard-of factor in racing, and it is to be hoped that within a few short years the seized piston or broken connecting-rod will be equally extinct.

Car balance has won several races within the last 3 years, previous to which time it was not considered seriously, the engineer and driver working more on larger valves, improved timing and stronger chassis parts. Today the weight carried on the forward wheels and that carried on the rear wheels is considered to the second or third decimal place. The car is weighed and re-weighed and every effort made to get to get the weights the same. This insures a car that will hold the road no matter at what speed it travels and when a car clings to the roadway there is not any loss in slippage between the tire and the road such as there is when the car is bounding into the air and permitting the rear wheels to spin at abnormally high speed while off the ground, only to act as an emery wheel to grind off the rubber on the tire treads when they finally strike the road surface. Due to such conditions car balance is imperative; it saves the motor from racing, it saves the tires from grinding off the tread and it saves the driver the discomfort of being pounded as he so often is.

Racing is for advertisement and it is questionable if there is any other phase of a racing machine that attracts greater attention than its ability to cling to the road surface and to run smoothly at high speeds. Every car driver, and nearly every car owner who has toured over American roads is familiar with the

pounding received in the tonneau seat due to stiff springs, poor body positioning, bad shock-absorbers and lack of car balance. To such the well-balanced car appeals with special significance.

Continued high speed has demanded more adequate lubrication, and while a few years ago there was often nearly half as many gallons of oil fed to the motor in a race as there were consumed gallons of gasoline today this extravagance has been eliminated and racing cars are being perfected which can carry an oil supply for a race of 500 miles, and one or two claim to carry capacity for 1,000 miles. The lubrication has been confined to force-feed to the bearings of the crankshaft and the connecting-rods. With such a system the amount of oil needed as compared with that consumed in splash is less than one-half and better results are being obtained. France is acting commendably in its announced rules for its 1913 Grand Prix race in which gasoline consumption is made a factor. The new rules require that the racer shall average approximately 14 miles to the gallon of fuel. The club is mastering the situation by insisting on manufacturing its own gasoline tanks, the fittings and pipings, and placing official observers over the cars to see that no violation of the rule is committed. Similar action was taken four or five years ago, but there was not any permanent result. Today with the rapid rise in the cost of fuel the enormous increase in the number of cars and other factors it is expected that something permanent will result so that, as far as motor efficiency is considered, there will be something rational in the racing machine, so that the stock product of the factory will benefit in this regard as a result of the races. That which is irrational cannot continue and even in free-for-all racing the rules must be marked by rational limitations. Otherwise the venture will consume itself in its own extravagances.

Canadian Customs Touring Rules

Great Increase in Number of Cars Crossing the Border Renders More or Less Red Tape Necessary

MONTREAL, QUE., Aug. 31—In view of the steadily growing volume of automobile tourist traffic between Canada and the United States, and vice versa, it is thought by local customs to be a fitting time for them to generally remind travelers, of the rules and regulations to which they must conform if they wish to journey without inconvenience or delay.

For Canadian-owned cars going into the United States it was explained this morning by the official in the department of the chief collector of customs, the owner thereof must first ask permission from the local customs authorities to export his car for touring purposes.

When this has been done, the car owner will be supplied with two forms which must be made out in duplicate giving name and address of owner, with the name of manufacturer of the automobile, the manufacturer's number, the number of cylinders in the car, the style, seating capacity, color, style of running gear, with what extras, glass windshield and speedometer, together with the numbers of each of the tires, back and front, etc.

One copy of the lengthy form so made out is to be given to the customs office at the last customs port on this side of the line, while the other is kept by the car owner until he returns to Canada, when it is given to the customs officers for purposes of comparison, with the duplicate in his possession.

In the case of American tourists coming into Canada not only must conditions like the aforesaid be complied with, but each car owner must deposit the sum of $25 as a mark of good faith as well as a bond representing twice the duty collectable on the car. Thus, for instance, if an American car worth $5,000 comes into Canada and on a basis of 35 per cent. is liable to pay $1,750.00 duty, the owner must take out a bond for $3,500 with some guaranteed bond company.

The bond expires and the $25 good-faith money is handed back as soon as the American car leaves this side.

If, however, an American tourist, coming into Canada, can produce two Canadians to sign a personal bond, the cash bond stipulation does not become necessary.

Over 500 automobiles, Canadian and American, have crossed the boundary line between Province and New York State since May 1 last.

Canada Has 21,920 Automobiles

Ontario Leads Provinces in Number of Cars in Use While Alberta Has Highest Population Ratio

MONTREAL, QUE., Sept. 3—The extent of the cult of the automobile in this country is clearly reflected in the following table showing the population and the number of cars now in use in each province of the Dominion:

Province	Population	No. of cars	Population per car
Nova Scotia	492,338	578	851
New Brunswick	351,889	592	594
Quebec	2,002,712	2,500	801
Ontario	2,523,208	7,338	344
Manitoba	455,614	3,000	152
Saskatchewan	492,432	2,537	194
Alberta	374,663	3,000	125
British Columbia	392,480	2,375	165

In comparison to population Alberta has the greatest number of cars. Last year 700 licenses were issued in Calgary and about 350 in Edmonton. Manitoba comes next with one auto to every 152 people in the province, and British Columbia third with one auto to every 165 persons. Nova Scotia has the smallest number of cars, and the ratio of autos to population here is the lowest. Ontario leads in the number of machines in use and has one car to each 344 of population. Western Canada generally is a far larger buyer than the East.

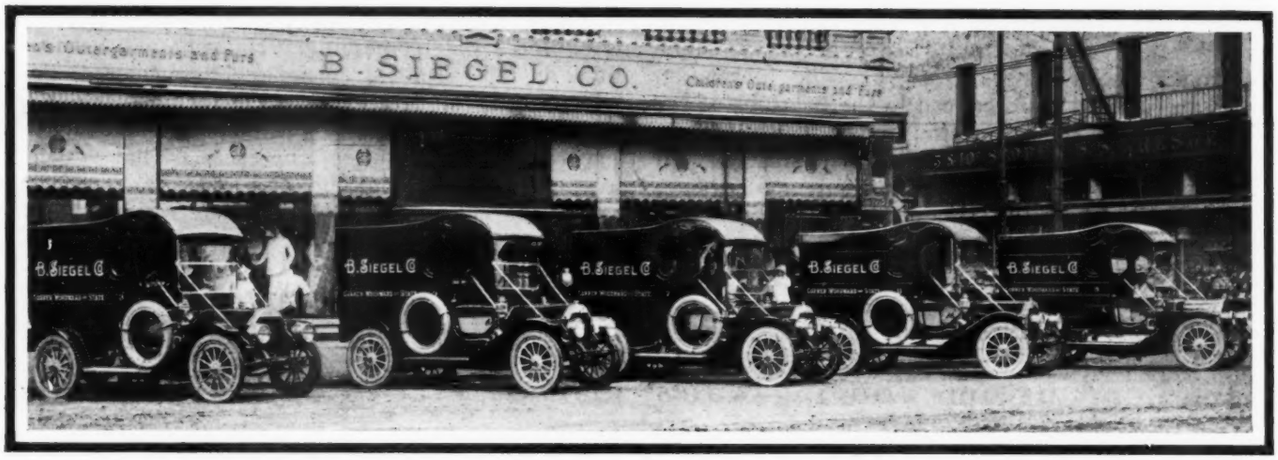
In addition to the licenses to residents of Ontario, 4,001 licenses were granted to tourists. In Manitoba cars transient through the province are not registered and have 30 days for touring that part of the country. After that time they are considered resident and have to take out a license.

Prince Edward Island is the only province which prohibits the use of motor vehicles on its highways and public places. This was thought necessary in the interest and for the safety of the traveling public. The penalty for breaking this law is $500 or 6 months in jail.

The following is a comparative statement of automobiles imported into Canada from the United States during 1909 to 1911, as compiled by the Department of Commerce and Labor:

Year.	No.		Value.	
1909	1,230		$1,457,129	
1910	3,102		3,340,326	
1911	4,687		5,057,927	
		9,019		$9,845,382
Value automobile parts:				
1909			$2,230,509	
1910			1,023,386	
1911			1,726,842	
				2,980,737
Total valuation of automobiles and parts				$12,826,119

News of the Week Condensed



The B. Siegel Company, Detroit, Mich., now has five Cartercar trucks which displace fifteen horses in the delivery department

SIEGEL Company's Five Cartercars—The above photograph shows the five Cartercars used by the B. Siegel Company, Detroit, Mich., in place of fifteen horses, which were formerly required to accomplish the deliveries. Located as this firm is, right in the very heart of the most congested business district, they could not possibly continue the old style delivery system without sacrificing considerable business.

Studebaker Declares Dividends—The Studebaker Corporation, Detroit, Mich., has declared its regular quarterly dividend of 1¾ per cent.

Halcomb Opens N. Y. Salesrooms—The Halcomb Steel Company, Syracuse, N. Y., has opened a sales office at 95 Liberty street, New York City, in order to give more efficient service to its customers.

Mitchell Joins Republic Tire—G. L. Mitchell has resigned managership of the Toronto, Ont., branch of the Diamond Rubber Company to become partner in the Republic Rubber Company, Detroit, Mich.

Eastern Canada Leads in Sales—Statistics just issued by a Canadian financial paper indicate that more automobiles are sold in western Canada than in the eastern section proportionately to the population.

Reo Divides Yearly Profits—The Reo Motor Car Company, Lansing, Mich., has announced its third distribution of profits this year amounting to about $200,000, which is 10.9 per cent. on its capital of $2,000,000.

Detroit Automobile College Opened—Wolverine Automobile College has been opened at 942 Jefferson Avenue, Detroit, Mich. Chester Arthur, formerly with the Automobile School of America, is chief instructor.

Baillargeon, President Peerless Tire—J. W. Baillargeon, president of the Autobus Company, Montreal, Que., has been chosen president of the Peerless Tire Company, organized to manufacture and market a leather tread steel-studded tire.

Lumbach with Studebaker Corporation—Henry Lumbach, assistant engineer of the R-C-H Corporation, has resigned to accept a position with the Studebaker Corporation as chief tool maker. His resignation will take effect September 1.

Arnold Enters Smith Company—E. A. Arnold, chief engineer and sales manager of the Metal Products Company, Detroit, Mich., resigned August 1, to enter the employ of the A. O. Smith Company, Milwaukee, Wis., as consulting engineer.

Muntz President Consolidated Motors—Gerard Muntz, director of Schacht Motor Car Co.., of Hamilton, has been chosen president of Consolidated Motors, Limited, Toronto, Ont., which has located its new establishment at 112-116 Richmond Street West.

Hamilton Club's Membership Campaign—The Hamilton, Ont., Automobile Club, largest of the affiliated clubs in the Ontario Motor League, is planning a big membership campaign and Secretary J. Overell and Main Johnson are arranging details and planning the organization.

Moyer Pathfinder All-Iowa Tour—W. E. Moyer, president of the Iowa Automobile Association, Des Moines, Iowa, left in a Hudson on September 1 to blaze the way for the All-Iowa tour which is to be held late in September. The tour will have entries from all parts of the state.

Truck Displaces Four Horses—A 2-ton motor truck has displaced two teams of horses in the service of the New York Central Railroad at West Albany, N. Y. The truck was placed in service hauling supplies and material from the city to the various departments of the railroad company.

Beedee Manager Wilcox Branch—R. E. Beedee, Davenport, Ia., has accepted the position of assistant general manager of the St. Louis, Mo., branch of the Wilcox Motor Car Company, Minneapolis. Mr. Wilcox has been for the last three years assistant manager of the Western Flour Mills Company, the largest milling company in Iowa.

Prince Edward Island Automobiless—Prince Edward Island is the only province in Canada that prohibits the use of automobiles on its highways and in public places. The penalty for violating this law, which was enacted because it was thought to be necessary to public interest and for the safety of the traveling public, is a fine of $500.00 or 6 months in jail.

New Agencies Established During the Week

Place	Car	Agent
Akron, Ind.	R-C-H	Karl B. Gast & A. A. Gast
Alexandria, La.	R-C-H	W. H. Ratcliffe
Albuquerque, N. Mex.	R-C-H	E. L. Bradford
Baltimore, Md.	Keeton	Baltimore Garage Co.
Baltimore, Md.	Lozier	The Schall-Crouch Auto Co.
Baltimore, Md.	Paige-Detroit	The Schall-Crouch Auto Co.
Batavia, N. Y.	R-C-H	Robert L. Hiller
Bayonne, N. J.	R-C-H	W. H Dykeman
Bay Ridge, N. Y.	Henderson	Chas. Frederick
Bordentown, N. J.	R-C-H	Samuel F. Garrison
Boston	Paige-Detroit	Lozier Motor Car Co.
Boston	Marmon	F. E. Wing Motor Car Co.
Bristol, Tenn.	R-C-H	Cannon Elect. Co.
Cambridge, Md.	Detroiter	E. J. Brannock
Canton, Ill.	Henderson	Meade McCatchey
Carlsbad, N. Mex.	R-C-H	Carlsbad Auto Co.
Charleston, S. C.	R-C-H	Automobile & Marine Motor Co.
Chattanooga, Tenn.	Packard	Bill Jones Auto Co
Chestertown, Md.	Detroiter	J. W. Russell
Chicago, Ill.	Henderson	J. G. Tennant & Co.
Chicago, Ill.	R-C-H	F. Ebann
Chicago, Ill.	R-C-H	W. C. Sporleder
Dallas, Tex.	American	Sacksteder-Potter Co.
Dallas, Tex.	Marion	Sacksteder-Potter Co.
Davenport, Ia.	White	Davenport Auto Truck Co.
Decatur, Ill.	R-C-H	G. F. Wisegarver
Deming, N. Mex.	R-C-H	Crescent Garage
Des Moines, Ia.	Everitt	Brown Corley Motors Co.
Des Moines, Ia.	Marion	Ryan Motors Co.
East Orange, N. J.	Henderson	Harold C. Slater
Edmonton, Alberta, Can.	Henderson	Standard Motor Car Co., Ltd.
Elyria, O.	Garford	Jackson & Harrison Auto Sales Co.
Enderlin, N. D.	R-C-H	W. J. Baribean
Fall River, Mass.	Henderson	F. W. Davis & Sons
Fresno, Cal.	Henderson	L. E. Grider
Fresno, Cal.	R-C-H	E. W. Johnson Co.
Gilroy, Cal.	R-C-H	McKenney & McKenney
Golden, Ill.	Henderson	Thesen & Gronewald
Grand Rapids, Mich.	Franklin	The Stratton & Woodcock Automobile Co.
Grand Salene, Tex.	R-C-H	B. W. Carrington
Green City, Mo.	R-C-H	Boyce & Born
Hamilton, Ont.	Regal	Stacker & Feeder Co.
Hardinsburg, Ind.	R-C-H	May & McPheeters
Havre de Grace, Md.	Detroiter	Sanders Machine Shop
Houston, Tex.	R-C-H	Northrupp & Clark
Howard, Pa.	R-C-H	Jackson Kline
Inverness, Miss.	R-C-H	Wallace & Tolar
Jamestown, N. D.	R-C-H	Wallace Donnelly Co.
Janesville, Minn.	R-C-H	E. Dieudonne & Son
Joplin, Mo.	Hupp-Yeats	C. H. Back
Kansas City, Mo.	Franklin	W. F. Kneip & E. F. Williams
Lake Wilson, Minn.	R-C-H	L. L. Grier & A. S. Peters
Lancaster, Pa.	Henderson	Automobile & Supply Co.
Lansford, N. D.	R-C-H	Brunner & Chambers
Las Animas, Colo.	R-C-H	P. W. Pittman
Le Roy, Kan.	R-C-H	P. C. Jones
Lima, O.	Chalmers	W. E. Rudy
Lindsay, Cal.	Henderson	E. C. Graham
Madison, Wis.	Cadillac	Statz Motor Car Co.
Madison, Wis.	Stoddard-Dayton	Statz Motor Car Co.
Madison, Wis.	Studebaker	Statz Motor Car Co.
Marlton, N. J.	R-C-H	Middleton Motor Co.
Martinsburg, W. Va.	Detroiter	Shenandoah Garage
Milwaukee, Wis.	Cadillac	Jonas Automobile Co.
Minneapolis, Minn.	Cartercar	Minnesota Cartercar Co.
Minneapolis, Minn.	K-R-I-T	Northwestern Auto Co.
Mays Landing, N. J.	R-C-H	Harry F. Birch
Montreal, Que.	Panhard	Major & Co.
Nacogdoches, Tex.	R-C-H	Baker & Wilson
Nashville, Tenn.	Franklin	Cumberland Motor Car Co.
New York City, N. Y.	Havers	Knickerbocker Motor Car Co.
Northport, L. I., N. Y.	Henderson	D. & W. Lawson
Ottawa, Ont.	Franklin	The Pink-McVeity-Blackburn Co.
Ottawa, Kan.	R-C-H	John Nelson & Son
Penn Yan, N. Y.	Rambler	A. H. Wagner
Petaluma, Cal.	Henderson	J. J. Tanner
Petersburg, Va.	Detroiter	George B. Carter
Pittsburg, Pa.	Henderson	Forbes Motor Car Co.
Plymouth, Ind.	R-C-H	F. H. Kuhn
Rialto, Cal.	R-C-H	J. W. Cramp
Riverside, Cal.	R-C-H	A. R. Riley
Rochester, N. Y.	Henderson	Knipper-Kipp Co.
Rochester, N. Y.	National	Mathias R. Kondolf
Rockland, Me.	R-C-H	Albert C. Jones
Roswell, N. Mex.	R-C-H	Pecos Valley Auto Co.
Roswell, Ga.	R-C-H	H. A. Walton & C. W. Ellington
Sacramento, Cal.	Henderson	Sacramento Motor Sales Co.
Santa Ana, Cal.	R-C-H	Frank Vegely
Seattle, Wash.	Stutz	W. P. Brawley & C. H. Moers
Selma, Ala.	R-C-H	S. H. Watts
Scranton, Kan.	R-C-H	Michael & Sappenfield Garage Co.
Skowhegan, Me.	Cartercar	Clyde H. Smith Auto Co.
Souderton, Pa.	R-C-H	The Souderton Garage
Springfield, Mass.	Henderson	Forest Park Garage
St. Catharines, Ont.	Reo	Reo Sales Company
Stockton, Cal.	R-C-H	E. E. Gross
Swedesboro, N. J.	Henderson	H. F. Hunter
Syracuse, N. Y.	Alco	Jefferson Garage Co.
Taneytown, Md.	Detroiter	George W. Demmitt
Tonom, Ont.	Panhard	Consolidated Motors
Tonom, Ont.	Schacht	Consolidated Motors
Toronto, Ont.	Gramm	Shaw Overland Sales Co.
Toronto, Ont.	King	Matheson Sales Co.
Tucson, Ariz.	R-C-H	Alfred S. Donau Auto Co.
Utica, N. Y.	Cartercar	L. H. Gardiner
Utica, N. Y.	R-C-H	I. R. Gardiner
Washington, D. C.	Pierce-Arrow	Foss-Hughes Co.
Watertown, Wis.	Overland	Buroff-Fuller Motor Co.
Watertown, Wis.	Regal	Buroff-Fuller Motor Co.
Wenona, Ill.	R-C-H	H. L. Webber
Wessington Spr'gs, S. D.	R-C-H	Western Machine & Motor Co.
Wichita, Kan.	R-C-H	C. A. Jones
Williamsport, Ind.	R-C-H	John E. Briggs
Winchester, Va.	Detroiter	E. A. Rogers
York, Pa.	Henderson	Auto & Truck Sales Co.

ELECTRIC CARS

Boston	Flanders Electric	J. S. Harrington & Co.
Washington, D. C.	Hupp-Yeats	Storm Motor Car Co.

COMMERCIAL VEHICLES

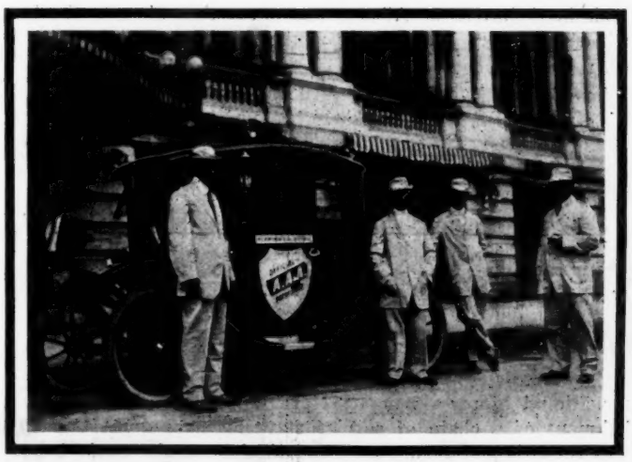
Atlanta, Ga.	Federal	Cole Motor Co. of Ga.
Buffalo, N. Y.	Federal	Sanderson & Burghardt
Columbia, S. C.	Federal	Gibbes Machinery Co.
Cleveland, O.	Federal	Eckenroth Sales Co.
Davenport, Ia.	Velie	Davenport Auto Truck Co.
Davenport, Ia.	White	Davenport Auto Truck Co.
Larned, Kan.	Federal	W. S. Young
Mobile, Ala.	Federal	Mobile Auto Co.
Memphis, Tenn.	Federal	John F. Cubbins
New Orleans, La.	Federal	Fairchild Auto Co.
Pittsburg, Pa.	Federal	Union Motor Car Co.
Sioux City, Ia.	Federal	Interstate Auto & Sup. Co.
Tecumseh, Mich.	Federal	L. C. Hayden
Tonom, Ont.	Detroiter	Consolidated Motors
Watertown, Wis.	Chase Truck	Buroff-Fuller Motor Co.
Washington, D. C.	Pierce-Arrow	Foss-Hughes Co.
Washington, D. C.	G. M. C.	G. E. Chapman
Washington, D. C.	Lauth-Juergens	Warren Motor Sales Co.
Winnipeg, Can.	Mack	Canadian Fairbanks Morse Co.

Tampa-Mitchell Agency Fails—The Mitchell automobile agency, Tampa, Fla., has failed. Marvin O. Hubbell, the agent, has left for parts unknown, although no criminal action is alleged.

Curtiss District Manager Chase—Royal B. Curtiss, of Stepney, Conn., has been appointed district manager of the Chase Motor Truck Company, Syracuse, N. Y., succeeding C. W. Moody, who resigned.

De Lisser Homeward Bound—Horace de Lisser, chairman of the Board of Directors of the Ajax-Grieb Rubber Company, sails for home August 31, on the steamer France. His mission was to establish Ajax agencies throughout Europe.

Flanders Electric Ends Trip—The Flanders Colonial Electric Pathfinding car of the American Automobile Association finished its long trip of over 1,721 miles from Detroit, Mich., to New Orleans, La., last Wednesday. The car was the center of an admiring throng which voiced its appreciation of the car's consistent performance under trying conditions.



The A. A. A. Flanders Colonial electric pathfinder and its crew

Pierce 5-ton truck which participated in Connecticut maneuvers

Colby Builds Branch—The Colby Motor Company, Minneapolis, Minn., branch is building a two-story structure 50 by 150 feet which is to be completed in 3 months.

Hadley Joins Lenox Company—W. K. Hadley will shortly join the Lenox Motor Car Company, Boston, Mass., as general sales manager and purchasing agent.

Jonas Company's New Building—The Jonas Automobile Company, Milwaukee, Wis., will on October 15 take possession of the new Cadillac Building now being erected for the firm.

Auto-Jack Marmon Equipment—The Marmon company, Indianapolis, Ind., announces the Hartford Auto-Jack as well as the Truffault-Hartford shock absorber as regular factory equipment.

Ford Has No 1913 Announcement—Adopting the 1908 Model T as a standard, as heretofore, the Ford Motor Company, Detroit, Mich., has no car announcement for 1913 to make to the trade.

Brown Resigns from Mais—Will H. Brown has resigned from the Mais Motor Car Company, Indianapolis, Ind. He will devote his attention to the Brown Commercial Car Company, Peru, Ind., which he organized.

Number Plate Contract Awarded—The Ohio Automobile department, Columbus, O., has awarded the contract to supply 75,000 sets of number plates for the year 1913 to the Scioto Sign Company, of Kenton, O., at its bid of 22 1-4 cents per set.

T. C. A. in Syracuse—Frederick H. Elliott, secretary of the Touring Club of America, which has previously been located with headquarters at Albany, announces that his organization will shortly open headquarters at the Onondaga Hotel in Syracuse, N. Y.

Seattle Club's Run—The third annual run of the Automobile Club of Seattle, Wash., will be to Cohasset Beach, Wash., August 30-31. The total distance from Seattle to Cohasset Beach is 171 miles. The route has been well marked to the beach.

State Fair's Automobile Show—An automobile show is being held at the Indiana State Fair, Indianapolis, Ind. This is the first time there has been any elaborate display of automobiles at the fair. There are nearly a dozen firms represented.

Establish Canadian Mack Agencies—An agreement between the Canadian Fairbanks-Morse Company and the International Motor Company, New York City, for the establishment of a chain of service stations throughout Canada, was recently put through. The principal stations will be at Montreal, Toronto, Winnipeg, and Regina.

Cars May Displace Mules—The experiment of towing canal-boats by automobiles was made last Tuesday at Pendleton, N. Y., by William Gleasner, superintendent of the Great Lakes Company, barge-canal contractors. With a 30-horsepower automobile he towed a canal-boat loaded with lumber for a distance of 3 miles at the rate of 6 miles an hour.

California's Sales Decrease—July showed a decided falling off in the number of new automobiles purchased in California as compared with the records of several preceding months. The report for July shows that 2,327 automobiles were licensed during the month, an average for each working day of eighty-six. During the 4 months preceding July the daily average was over 100, and in June reached 109.

Pierce-Arrow in War Maneuvers—The Pierce-Arrow 5-ton truck made a fine record in the recent army maneuvers. This truck hauled the Fourth Brigade baggage and supplies from Buffalo to New Haven, Conn., then participated in the army maneuvers and returned overland to Buffalo with its original load. The accompanying photograph shows the truck as it was, just ready to leave the armory of the Sixty-fifth Regiment, N. Y. N. G., for the scene of the maneuvers.

Automobile Incorporations

AUTOMOBILES AND PARTS

AUGUSTA, MAINE.—United Motor Equipment Company; capital, $1,000,000; to manufacture motors. Incorporator: E. M. Leavitt.

BUFFALO, N. Y.—A. W. Haile Motor Company; capital, $25,000; to deal in automobiles. Incorporators: Arthur W. Haile, Bradley H. Phillips, E. C. Schlenker.

CHICAGO, ILL.—Parker Motor Company; capital, $5,000; to manufacture motors. Incorporators: Hugo W. Schnetzky, Frederick D. Parker, Archie E. Cole.

ELIZABETH, N. J.—Franklin Automobile Company; capital, $25,000; to manufacture motors. Incorporators: W. H. Reynold, M. Gordon, L. Koplan.

FLINT, MICH.—Sterling Motor Company; capital, $300,000; to manufacture motors. Incorporator: W. C. Durant.

HAMILTON, O.—Hamilton Vehicle Company; capital, $50,000; to manufacture automobiles. Incorporators: A. A. Dornbush, Louis J. Brenig, William Kloeb.

INDIANAPOLIS, IND.—Hydraulic Transmission Company; capital, $200,000; to manufacture hydraulic transmissions. Incorporators: Wm. F. Ernest, Paul Millholland.

INDIANAPOLIS, IND.—W. K. Millholland Machine Company; capital, $50,000; to manufacture motor car parts. Incorporators: W. K. Millholland, Paul Millholland, A. M. Millholland.

MONTREAL, QUE.—Drednot Motor Truck Company; capital, $50,000; to manufacture motor trucks. Incorporators: W. L. Haskell, H. S. Rose, John S. Rigby, V. S. Rose, L. C. Haskell, J. E. Merritt, D. S. Whittall.

NEW YORK CITY, N. Y.—Triple Action Carbureter Company; capital, $200,000; to manufacture carbureters. Incorporators: Mathias Weiwoda, Frederick Hooschar, Edmund F. Driggs.

NEW YORK CITY, N. Y.—Viking Manufacturing Company, of Manhattan; capital, $25,000; to manufacture automobiles. Incorporators: A. R. Bangs, R. Condon, A. O. Briggs.

NEW YORK CITY, N. Y.—Roulements E. DeBois Ball Bearing Company; capital, $25,000; to manufacture ball-bearings. Incorporators: John S. Sherman, W. W. Sherman, H. T. Sherman.

PITTSBURGH, PA.—Universal Shoe & Forge Company; capital, $50,000; to manufacture automobile parts. Incorporators: J. H. Wall, P. A. K. Black.

PONTIAC, MICH.—Pontiac Automobile Castings Company; capital, $15,000; to manufacture motor parts.

RACINE, WIS.—Wadewitz Machinery Company; capital, $50,000; to manufacture motors.

STILLWATER, MINN.—Republic Motor Company; capital, $10,000; to manufacture automobiles. Incorporators: G. H. Sullivan, L. L. Manvering, Paul H. Guilford.

TROY, N. Y.—Pinoeer Motor Car Company; capital, $10,000; to manufacture automobiles. Incorporators: H. J. Richardson, N. R. Holmes, G. N. Nay.

UNION, N. Y.—Clifton Automobile Company; capital, $10,000; to manufacture automobiles. Incorporators: Benjamin F. Krom, Walter Sakuette.

GARAGES AND ACCESSORIES

ALBANY, N.Y.—Fiat Motor Sales Company; capital, $300,000; to deal in motors, engines and machinery for automobiles. Incorporator: Charles L. A. Whitney.

BIRMINGHAM, ALA.—Robertson Tire & Automobile Company; capital, $2,000; to deal in supplies. Incorporators: J. E. Vandergriff, E. R. Minhinette, Jr., W. W. Robertson.

BOSTON, MASS.—Fenway Garage Company; capital, $250,000; to carry on a garage business. Incorporators: Josiah C. Cannon, Chester W. Engel.

BOSTON, MASS.—Motor Monitor Company; capital, $20,000; to deal in supplies. Incorporators: Howard P. Soule, Gardner W. Chase, Richard S. True.

BOSTON, MASS.—Standard Automobile Supply Company; capital, $100,000; to deal in supplies. Incorporators: Michael F. Culliney, Edith W. Shepherd.

CHARLOTTE, N. C.—Model Garage; capital, $25,000; to carry on a garage business. Incorporators: R. F. Price, E. T. James, R. B. Cochrane.

CHICAGO, ILL.—Chicago Cyclecar Company; capital, $2,500; to deal in motors, automobiles. Incorporators: Franklin A. Dean, Jr.; Harris Carman, Lufkin Dwight P. Green.

Yeoman Becomes Ames Manager—Mr. George W. Yeoman has become general manager of the Ames Motor Car Company, Owensboro, Ky.

May Raise Insurance Rates—Insurance companies in Baltimore, Md., are raising the rates of accident premiums on automobiles in consequence of the steady increase in mishaps.

Winning Cars Rayfield Equipped—De Palma, in a Rayfield equipped Mercedes, won the Elgin National Race. Mulford, driving Knox, also equipped with a Rayfield carbureter, came in second.

Goodyear's Baltimore Building—The Goodyear Tire and Rubber Company, Baltimore, Md., is erecting a handsome new building at the corner of Cathedral and Preston streets. Frank M. Olmstead is manager.

Bromwell with Nebraska Cartercar—Tom Bromwell, who for several years has been sales manager for the H. E. Fredrickson Company, has resigned to accept a like position with the Nebraska Cartercar Company, Omaha, Neb.

Braender Tire Brooklyn Branch—The Braender Rubber & Tire Company, New York City, with factory at Rutherford, N. J., has established a branch office and salesroom at 1211 Bedford avenue, Brooklyn, N. Y. S. W. Smith is manager.

Automobile Incorporations

CHIPLEY, FLA.—Punctureless Tire Company; capital, $12,500; to make tires. Incorporators: L. W. Crow, J. S. McCreachy, C. B. Dunn.

CINCINNATI, O.—J. C. Hopkins Manufacturing Company; capital, $10,000; to manufacture automobile gloves. Incorporator: John C. Hopkins.

DILLON, S. C.—Roach & Carmichael Company; capital, $3,850; to deal in automobiles. Incorporators: C. A. Roach, H. H. Carmichael.

HIGHLAND PARK, N. Y.—Walter Williamson Automobile Company; capital, $10,000; to deal in automobiles. Incorporators: W. M. Williamson, Watson Whitlesey, Vernon J. Miller.

HULL, QUE.—Hull & Ottawa Garage Company; capital, $40,000; to carry on a garage business. Incorporators: V. P. Leduc, Jos. Gravelle, J. Fortin, Chas. Leduc, L. A. Leduc, E. Morin.

INDIANAPOLIS, IND.—McLellen Automobile Shop; capital, $1,000; to deal in supplies. Incorporators: F. P. McLellen, F. E. Barrett, J. M. Miles.

KANSAS CITY, MO.—Packard Kansas City Motor Company; capital, $2,000; to deal in automobiles. Incorporators: Joseph B. Renshaw, Robert Sloan, R. J. Ingraham.

MEDINA, O.—Medina Machine Company; capital, $25,000; to deal in repairing all kinds of machinery. Incorporators: F. W. Woods, F. M. Branch, C. R. Warner, C. V. Neumeyer, W. T. Kennedy.

MILWAUKEE, WIS.—Badger Oil & Specialty Company; capital, $25,000; to deal in supplies. Incorporators: Benjamin Margeles, W. A. Nash, R. M. McKay.

MILWAUKED, WIS.—Lozier Livery Company; capital, $25,000; to operate a motor livery service. Incorporators: Richard H. Knowles, R. P. Druecker, F. W. Loomis.

MINNEAPOLIS, MINN.—Dahl Punctureless Tire Company; capital, $6,000,000; to manufacture tires. Incorporators: I. Seery, Russell N. Stewart, Homer St. Denehy, Thomas A. Callahan, Thomas C. McNamee.

NASHVILLE, TENN.—Cumberland Motor Company; capital, $10,000; to deal in automobiles. Incorporators: W. D. Caldwell, J. H. Cheek, J. O. Cheek, Jr.; D. M. Bayer.

NEW YORK CITY, N. Y.—Trevent Tire Company; capital, $100,000; to manufacture tires. Incorporators: N. A. Sterling, M. Rachmil, S. King.

NEW YORK CITY, N. Y.—Ideal Automobile and Garage Company; capital, $10,000; to carry on a garage business. Incorporators: John W. Colloph, Reginald H. Smith, Alfred P. Morewood.

NEW YORK CITY, N. Y.—North River Garage; capital, $20,000; to carry on a garage business. Incorporators: W. E. Lockwood, Leonard E. Jelly, Robert E. Shaw.

PORTLAND, ORE.—Automobile Air-Rotar Company; capital, $15,000; to deal in machines and automobiles. Incorporators: Albert F. Jones, T. L. Corteau, James E. Manter.

SAN ANTONIO, TEX.—Guarantee Motor Car Company; capital, $10,000; to deal in automobiles. Incorporators: J. F. Hagan, H. J. Smith, C. W. Voss.

ST. JOSEPH, MO.—Ardery Holliday Motor Car Company; capital, $10,000; to deal in automobiles. Incorporators: J. W. Ardery, J. W. Holliday, W. S. Thomson, Charles Ardery, W. H. Watson.

TROY, N. Y.—Troy Motor Company; capital, $10,000; to deal in automobiles. Incorporators: Fred S. Snyder, Frank A. Snyder, John B. Wood, J. A. Wendell, Richard G. Thornmeyer, H. P. Schoenmaker, C. R. Kilmer.

WILMINGTON, DEL.—Overman Tire Company; capital, $3,000,000; to manufacture tires. Incorporator: Herbert E. Latter.

VANCOUVER, CAN.—Pacific Automobile Company; capital, $500,000; to carry on a taxicab business. Incorporators: Noel Humphreys, G. M. Gibbs, A. S. French, J. L. Langan.

CHANGES OF NAME AND CAPITAL

CHICAGO, ILL.—Keith Car Company; increase of capital from $30,000 to $100,000.

CLEVELAND, O.—Marathon Tire & Rubber Company; increase of capital from $10,000 to $100,000.

COLUMBUS, O.—E. M. F. and Flanders Sales Company; change of name to G. E. Thomas Company.

ST. LOUIS, MO.—St. Louis Motor Truck Company; increase of capital from $17,500 to $22,500.

Cavalry in the maneuvers as seen from the tonneau of a Thomas

Guests of Oakland Manager—The district manager, retail sales force and service department men of the Atlanta branch of the Oakland Motor Company were the guests of Manager L. F. Smith at a banquet recently in the banquet hall of the M. & M. Club, Atlanta, Ga.

Has Its Own Transportation—The Pence Automobile Company, Minneapolis, Minn., will commission its own exclusive automobile freight train to travel all winter between Flint, Mich., and Minneapolis, Minn., to haul 2,500 Buick cars from the factory to the Northwestern distributing agency.

Office Opened at Springfield—The Essenkay Company of Chicago, that recently opened a place in Boston, has done so well that salesrooms for the product have been opened now at Springfield, Mass., at the corner of Fort and Water streets. It is known as the Western Massachusetts Essenkay Company.

Carter Car in Minnesota—The Minnesota Carter Car Company has been organized with A. R. Workman, formerly of Ainsworth, Neb., as president. A factory branch of the Carter Car Company, with Minnesota, Montana, the Dakotas and northern Wisconsin as the distributing territory, will be established.

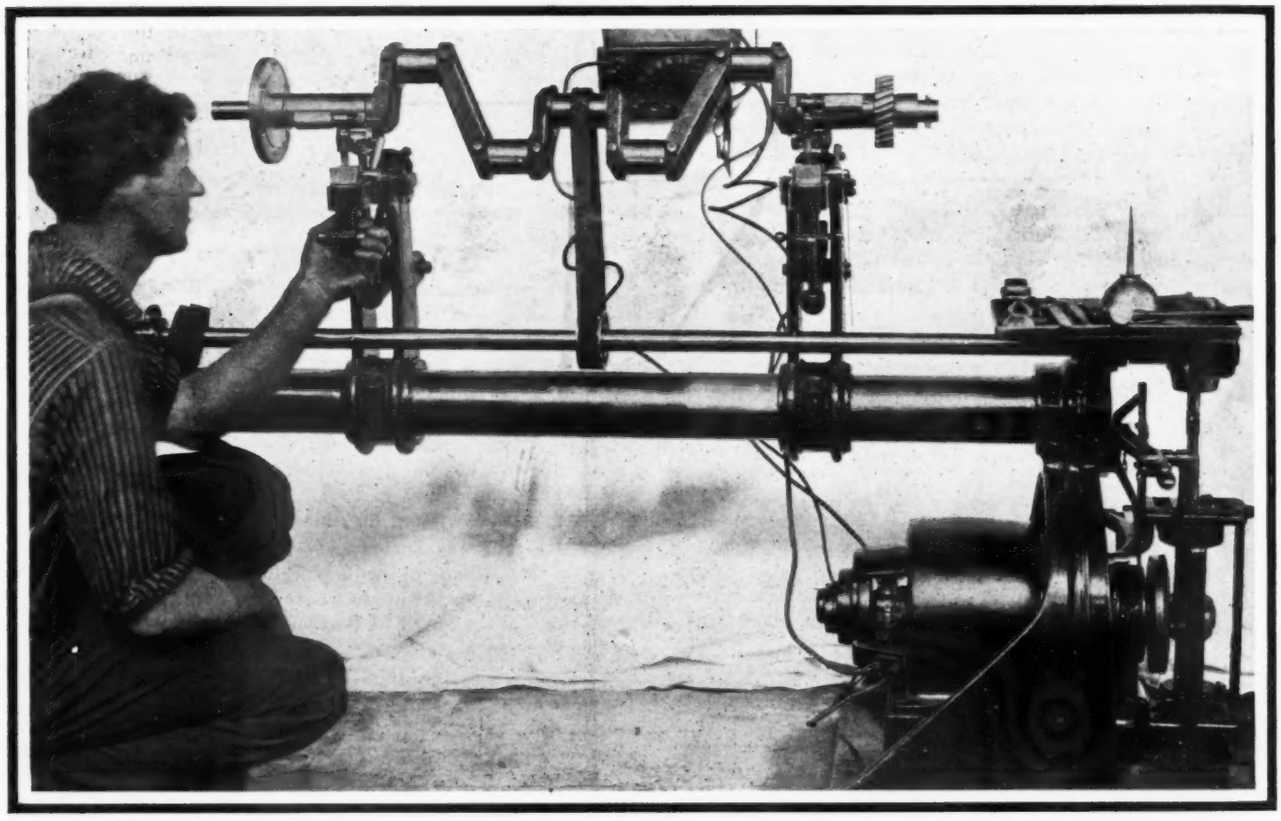
Texas Automobile Sales Increase—The sales of automobiles in Texas for the past few weeks show a remarkable increase owing to the harvest of an abundant wheat and oat yield, the prospects for a great corn and cotton crop and many other favorable conditions. Dallas dealers declare that the demand for machines is greater than the supply.

Berkeley Motor Car Company Formed—The Berkeley Motor Car Company has just been formed in Boston by J. H. Freeman, formerly with the Cadillac, as manager, and George Tollman, of the Chalmers, to deal exclusively in used cars, the new company announcing that it gives a guarantee that if anything goes wrong within a year on a car, due to the car itself, it will make good the loss.

Grossman Offers Milwaukee Prizes—The Emil Grossman Company, New York City, manufacturers of automobile accessories, are offering the following prizes to participants in the Milwaukee races, providing they use Red Head spark-plugs: To the winner of the grand prize, $500; to the winner of the Vanderbilt Cup, $500; to the winner of the Pabst Trophy, $100, and to the winner of the Wisconsin Challenge, $100.

Slupecki Making Carbureter—Lawedig Slupecki, inventor of an auxiliary carburetion device for gasoline motors, now being manufactured and marketed by the American Compensated Valve Company, of Manitowoc, Wis., is making exhaustive tests of a new type of carbureter which permits of the use of the heavier distillates of petroleum instead of gasoline. The device is being tried on a powerful motor boat built by Mr. Slupecki for use on Lake Michigan.

Factory Miscellany



Machine which is used in the plant of the Haynes Automobile Company, Kokomo, Ind., for balancing crankshafts accurately

The object of this machine is to obtain the kinetic balance of the rotating parts of the motor. The static balance of the part is secured by merely trying the parts to determine if they can remain stationary at any point when supported at the axis. This machine gives the running balance of the parts with great accuracy, thus tending to reduce vibration when the motor is running. When measured mathematically the balance of a machine can never be perfectly determined because both primary and secondary forces and moments are involved, and although the first may be reduced to zero the secondaries can rarely, if ever, be nullified.

MORROW'S Elmira Factory—The Morrow Manufacturing Company, Elmira, N. Y., makes all the small parts for the Overland cars, manufactured by the Willys-Overland Company, of Indianapolis, Ind., and Toledo, O. The accompanying photograph shows the Morrow plant.

Gibney Remodeling Lee Plant—The James L. Gibney Company, Philadelphia, Pa., is remodeling the J. Ellwood Lee plant at Conshohocken for the manufacture of truck tires.

Dean Horns for Studebaker—The Studebaker Corporation of Detroit, has placed an order with the Dean Electric Company, of Elyria, O., for 45,000 "Rexo" electric horns to be delivered during the coming year.

Stegeman's New Milwaukee Factory—The Stegeman Motor Car Company, of Milwaukee, Wis., has just finished moving into its new plant with general office quarters at 606 Linus street. Their new factory will increase the present capacity and give them an annual output of 500 trucks.

No New Rambler Factory—Officials of the Thomas B. Jeffery Company, of Kenosha, Wis., state that the company does not contemplate the erection of any new buildings on the 9-acre tract adjoining its present works, recently purchased, for the present. The additional land is to take care of the future needs of the Rambler works as they may develop.

Chase Company's Model M—The Chase Motor Truck Company, Syracuse, N. Y., announces to the trade a new model express truck of 500 pounds capacity. It is to be known as "Model M" and has a 12-horsepower, two-cylinder motor, planetary transmission with two speeds forward and reverse and chain drive. The wheelbase is 84 inches and the weight 1,500 pounds.

Wadewitz Company's Experimental Shop—The Wadewitz Machinery Company, of Racine, Wis., incorporated a few weeks ago with $50,000 capital, is establishing an experimental shop at Racine for the practice of motor car engineering and the manufacture of devices for the general mechanical engineering field. One of the principal devices already perfected, and to be manufactured without delay, is a spring starter for motor car engines, which has proven successful in exhaustive tests made by motor car manufacturers at Racine.

Canton Spring Company's Factory—A building permit has been issued for the erection of a $10,000 plant on Dueber avenue, Canton, O., for the Cleveland-Canton Spring Company, which will make all kinds of vehicle springs.

Smith Automobile Plant Sold—The Smith automobile plant was purchased at bankrupt sale by C. E. Gault and J. D. Mulvane, who will maintain the parts and do a general repair business, but have discontinued the manufacture of cars.

Big Addition to Plant—The General Vehicle Company, Long Island City, N. Y., manufacturer of electric trucks, will make a six-story addition to its present plant here. Plans for the foundation only estimate the cost at $50,000. The building will be located on Starr avenue, Long Island City.

Imperial Rubber Company's Factory—Residents of Tilbury, Ont., carried a by-law last week to grant a loan of $5,000 to the Imperial Rubber Company for immediate construction of their factory in which to manufacture rubberized cloth for automobiles. The loan is repayable in 10 years without interest.

Guarding Against Gas Explosions—As a precaution against gas explosions in the mammoth plant of the A. G. Smith Company, Milwaukee, Wis., manufacturing pressed steel frames, it has been decided to rebuild and relocate the welding department, blown up recently, on ground remote from the general factory buildings, the largest of which measures 345 by 1,025 feet.

Kissel Company's Shop Building—The Kissel Motor Car Company, Hartford, Wis., has broken ground for a large addition to its foundry department, the new shop building having just been completed. The latest structure measures 85 by 121 feet, two stories high. Two large new core ovens are also being constructed and much new power equipment is being placed at this time, this including a 480-horsepower electric generator and an 80-horsepower compresser. An addition to the power plant will be started at once.

Installs Truck Plant—The plant of the Stewart Iron Works, Cincinnati, O., destroyed by fire recently, and which was one of the largest ornamental and structural iron works in the country, will be rebuilt. The regular business of the company has been fence and other iron work of like character, but their new plans embrace the addition of a complete auto truck plant. This will occupy a ground space of 100 by 145 feet. It is the purpose of the company to specialize on the manufacture of 1-ton truck. This branch of the business will be under the supervision of W. M. Taylor, an automobile manufacturing expert, formerly of Toledo, O.

Ford Plant Nearly Ready—With its capacity more than doubled, the new factory of the Ford Motor Company, Detroit, Mich., within the next few months, will be ready to commence on its huge production for the coming year. The size of the foundry has been doubled, as has that of the heat-treating plants and machine shops. The big gas engine of 1,500 horsepower that has been doing duty furnishing power, the largest gas engine in the world, is soon to give way to an even larger one, an engine of 5,000 horsepower. At present about 350 cars are being built in 8 hours. When the new apparatus is in commission the Ford factory will be in a position to turn out more than twice that number of completed model T's in an 8-hour day.

Overland's Unique Building Plan—The Willys-Overland Company, which is doubling the capacity of its plant in Toledo, O., has employed a unique method of construction in the erection of the new transformer station in the center of the big factory buildings which has created considerable interest among contractors. After signing the contracts President J. N. Willys awoke to the fact that carrying the material for the new structures through the main gates would block the factory system and more or less cripple the production of Overland cars, which cannot at best be turned out fast enough to supply the orders that are daily pouring in, as well as interfere with the testers and hold up the installation of new machinery, parts and materials. A consultation with architects and contractors followed and it was decided to have all cement, glass, dynamos and other materials carried over the tops of the three-story factory building. Derricks were raised and spouts constructed for the work. All cement is being mixed outside the main plant, hoisted above the outside factories and poured through the spouts to the site of the new building. Thus the work on the new building is progressing with all possible speed and the efficiency of the Overland production is being maintained. It costs more, but results justify the expense.

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Machine Shop and Foundry Figures

WASHINGTON, D. C., Sept. 3—Census figures on the foundry and machine shop industry in the United States when the thirteenth census was completed show that there were 13,253 shop establishments in the United States, employing 615,485 perons. The employees were divided as follows:

Proprietors and firm members	9,851
Salaried officers	21,754
Male clerks	42,242
Female clerks	10,627
Average wage-earners	531,011
Total	615,485

The value of products per annum is figured at $1,228,475,148. The statistical bureau reports that the sum of $688,464,009 is added to the cost of materials by the manufacturing processes. In the industry, Pennsylvania takes first rank and New York second.

Factory of the Morrow Manufacturing Company, Elmira, N. Y., which makes all the small parts for Overland cars

AUTOMOBILE Carbureter—In which the nozzle opening is altered with different throttle adjustments.

The carbureter referred to in this patent is seen in Fig. 1, where A is the air inlet of the mixing chamber, O its outlet and N the nozzle through which the gasoline enters that chamber and which is regulated by a needle valve V. The gasoline enters the carbureter at E and passes into the mixing chamber after having passed through the float chamber, where its level is regulated by the float F. The capacity of the passages A and O may be varied by two throttles, each serving one of them and attached to a shaft which extends through these passages. The throttles are regulated by a throttle lever secured to the above mentioned shaft. A clever construction L is independent of the throttle lever, but is actuated thereby for opening the fuel valve V, permitting also of adjusting the lever L without disturbing the throttles controlling A and O.

No. 1,033,886—to William M. Gentle, Greenwood, Ind. Granted July 30, 1912; filed December 1, 1910.

Exhaust Whistle—Which consists of a tube with a slit at its end and a resonant chamber with a suitably shaped, sound-producing edge.

This patent describes an exhaust horn comprising a resonant chamber having an opening through its wall, against which is placed the slit-like opening of a tube which is adapted to be connected to the exhaust pipe. This tube has its lower portion movable, so that, if this portion is moved away from the tube, the slit is widened and the exhaust gases passing through the tube are afforded an unobstructed exit therefrom.

No. 1,031,678—to Elias W. Schurman, assignor to the Randall-Faichney Company, Boston. Granted July 2, 1912; filed January 25, 1909.

Automobile Extricator—Mechanism for hauling automobiles out of mudholes in the road, etc.

In Fig. 2 is shown the device described in this patent. It consists of a frame which is formed of a U-shaped bar, the ends of which are connected by a cross-piece C. From the side bars of the frame, legs are suspended at front and rear and cross bars B are attached to the inner extensions of the legs. Extensions E pendant from the end of the frame are rearwardly inclined, and adapted to enter the road surface to form means for anchoring. A drum is mounted on the frame and to an extension of its journal a toothed wheel is secured; a pawl connected to the frame is adapted to engage the toothed wheel to prevent backward rotation of the drum. On the shaft or journal of the drum an operating lever is mounted which carries a pawl engaging the toothed wheel so as to move it by stages. A flexible connection is provided, the end portion of which is wound around the cable, and another connection is attached to it and has its end secured to the axle of the automobile, so that by rotating the shaft of the drum, the car may be moved.

No. 1,034,635—to Henry S. McCall, Ogeechee, Ga. Granted August 6, 1912; filed February 20, 1912.

Compressed-Air Engine Starter—In which a flexible connection moved by a piston rod spins a spool on the crankshaft.

This patent refers to a starter mechanism, Fig. 3, consisting of a compressed-air motor cylinder C in which a piston P is reciprocated by the pressure of air entering at the side of the cylinder. The piston has a piston rod R secured to it; to the end of the latter a flexible connection F is secured which is laid around suitable idler sheaves and around a spool S connected with the crankshaft by a clutch mechanism. The piston rod also carries means for controlling the inlet and exhaust of compressed air to and from the starter cylinder.

No. 1,035,091—to George Hartwell Kelley, Gainesville, Fla. Granted August 6, 1912; filed July 21, 1911.

Automobile Self-Starter—Composed of a gas reservoir in communication with an engine cylinder and charged through a valve from the latter.

The starter referred to in this patent is seen in Fig. 4. It consists of a reservoir chamber connected with one of the engine cylinders, an automatic valve being interposed between these two parts. There is also a valve which serves to provide communication between cylinder and reservoir to allow of charging the latter. This valve has a cam surface and the automatic valve has a part which is in the range of action of the automatic valve and adapted to be lifted thereby.

No. 1,034,274—to George E. Miller, Oakland, Cal. Granted July 30, 1912; filed November 9, 1911.

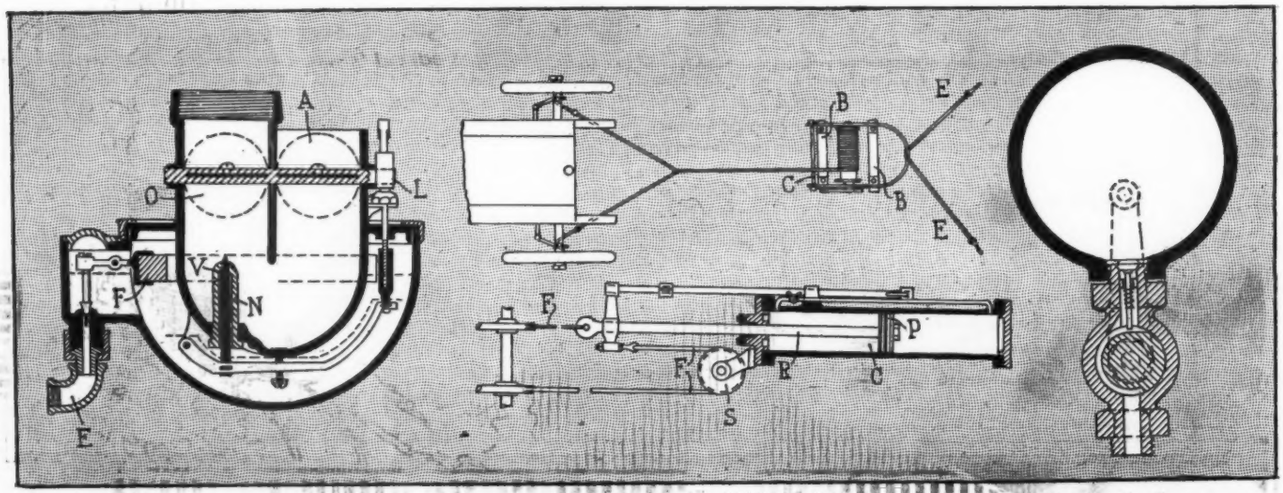

Fig. 1—Gentle carbureter. Fig. 2—McCall extricator. Fig. 3—Kelley compressed air starter. Fig. 4—Miller reservior self-starter